DAY 3: SOIL IS MORE THAN DIRT

OBJECTIVES

The students will:
1. Increase their knowledge of the composition and formation of soil.
2. Compare the soil structure of prairie soil and another soil.

BACKGROUND

Soil: Soil is much too precious to just call it dirt. Soil is the basis of all life. We walk on it, grow crops on it, pave it over for roads and airports, and all too often take it for granted.

Prairie soil is a source of nutrients because its many decomposers (641,000 fungi and more than 20 million bacteria per acre) break down dead plant and animal materials into important nutrient elements such as carbon and nitrogen. These nutrient elements are stored in the soil until they are taken through the roots of plants. The end result - that dead materials are recycled into nutrient elements that help plants grow - is called the nutrient cycle. (See Student page 2: *Nutrient Cycle)*

Prairie soil is also a shelter. When harsh weather or fire sweep across the prairie, the roots and buds of plants are tucked away safely in the soil. When the aboveground parts wither and die in late summer and fall, the roots and buds live on through the winter, waiting to send new shoots up through the soil in spring. Animals, too, depend on the soil as a refuge. The deer mouse builds its small nest underground and hoards seeds for winter use in burrows near its nest. Although it does not hibernate, the badger uses its burrow in spring as a nest chamber to sleep for several days. The Franklin's ground squirrel, on the other hand, hibernates in its burrow throughout the winter months. Many birds, reptiles and amphibians also find refuge in the soil.

Soil Formation: Soil is formed in two ways: building up and breaking down. Soil formation is influenced by five factors: climate, organisms, topography, parent materials and time. By the interaction of climate and organisms over a long period of time, soil is created. This period of time depends on the nature of the materials. It takes 100 to 600 years, or more, to form an inch of topsoil. Parent materials include rock debris, sand-silt and clay-sized particles transported and deposited by water (called sediment), ice (glacial drift), and/or wind (loess) and out croppings of bedrock. The minerals of the soil come from the roots of plants, leaves, twigs, insects and other organisms that are decomposed.

Different soils develop under different climatic conditions. Also, variations in the type of vegetation and organisms that decay in the soil cause soil to differ. There are more than 20,000 kinds of soil in the United States. Some of these include forest soils, tropical soils, prairie soils and rainforest soils.

Soil Particles: Most soil contains a mixture of particles. Sand, the largest of the three soil particles, ranges from .05 to 2.0 millimeters in size. If the soil has an adequate amount of sand particles, it can hold enough water for vegetation. Silt is the medium-sized particle that feels like flour. Silt particles are .002 to .05 millimeters in diameter. The smallest particle is clay. Clay is too small to be seen with a magnifying glass. When wet, clay particles are slick and sticky.

Soil Profile: A soil profile is a slice of earth several feet deep. Most soil profiles have a surface layer of organic material and two or three layers of mineral materials. Soil is broken into three major layers: topsoil, subsoil and parent material.

Topsoil, the A horizon, is the upper six to ten inches of soil. It contains most of the soil's living organisms, and it is rich in nutrients. It is dark, ranging in color from gray-brown to black. Darker colors come from rotting organic matter called "humus" which keeps the soil loose. Humus is like a sponge because it absorbs water and holds it for plants to use. The plant roots, bacteria, fungi and small animals are abundant here.

The next layer is called subsoil, the B horizon. It holds water and some plant nutrients, but it is less fertile than the topsoil, containing less humus, roots and organisms. The subsoil is clay-like - it is usually harder when dry and stickier when wet than the surrounding soil layers. Subsoil is lighter-colored.

The C horizon is called parent material because it is the weathered rock and partly weathered soil from which the soil layers were formed. Parent materials can be rocks, materials left by glaciers, materials left by wind, and water or even organic matter such as plants. (See Soil Profile transparency.)

MATERIALS

* Book, *Addie Across the Prairie*
  Journal
  Prairie mural construction materials
  Prairie soil samples (optional)
  Digging trowel
  Vials or small containers
* Student pages - *Soil is More Than Dirt*
  Soil Word Web
  Nutrient Cycle Explanation
  Nutrient Cycle Worksheet
* Teacher pages - *Soil Word Web Answer Sheet*
  Nutrient Cycle Answer Sheet
  Dirt Cake Recipe
* Transparency Master - *Soil Profile*

Starred (*) materials are provided in this packet.

VOCABULARY

erosion: The loosening and movement of soil by wind, raindrops, moving water, ice or landslides.

habitat: A place where plants and animals grow, live, and reproduce.

loam: A soil containing sand, silt, and clay.

nutrient: A substance that supplies nourishment for an organism to live.

organisms: Living things.

parent material: Materials, such as rock or dead plants, that break down or decay to form soil.

sediment: Soil that is deposited by water or wind.

silt: A medium-sized soil particle. Silt helps the soil become rich and loose.

soil: A dynamic mixture of broken-down rocks, air, water, and plant and animal material.

topsoil: The uppermost layer of soil. This is the richest, most productive layer of soil.

PROCESS

Observing, comparing and contrasting, recognizing relationships, drawing conclusions.

PROCEDURE

1. Soil Is More Than Dirt
   A. Read "Soil Is More Than Dirt."

   B. Do the *Soil Word Web* student page.

   C. Divide a soil sample (30.5 cm X 30.5 cm X 10 cm deep) among cooperative groups of three or four students.

   D. Ask students to observe and identify objects found in the soil dividing the objects into two categories - living and nonliving.

   E. Discuss the nutrient cycle using student page.

   F. Using the *Nutrient Cycle* page, have students fill in the time order for the nutrient cycle.

2. Soil Particles
   A. Collect soil samples from a playground or vacant lot. Crush the lumps. Remove rocks and roots.

   B. Pour the soil samples into a jar until they are 1/4 full. Add water until the jars are full.

   C. Add two teaspoons of detergent or dishwashing soap. Close the lid tightly. Shake the jars three to four minutes.

   D. Poke holes in the lid and set the jars in a safe area, free from disturbance for at least two to three days or until the particles settle into observable layers.

   E. After the particles have settled, examine the soil sample's texture, color, and amount of sand, silt and clay. Ask students to predict how well plants will grow in this type of soil. OPTIONAL: If you are able to obtain soil samples from a prairie, distribute them to each cooperative grouping.

   F. Ask students to compare their soil samples with the prairie soil sample, using a "compare and contrast format.

3. Soil Profile

   Using the soil profile transparency discuss differences in the horizons (depth, color, plant growth, soil particles and rock size). Why is the particle size important to plant growth and the water-holding capacity of soil? What results if plant cover is absent?

4. Dirt Cake

   This is an excellent culminating activity and can be served to visiting parents.

5. Continue ongoing activities.

ASSESSMENT

The following list suggests ideas or topic questions.

Explain the difference between prairie soil and soil from other areas.
Discuss some of the things that have happened to prairie soil. How has it changed?
Write down hypotheses, observations and conclusions of the experiments/lessons.
How can you help preserve, restore and conserve prairie soil?

EXTENSION ACTIVITIES

1. Have students experiment with different processes that help create soil.

   Abrasion - Rub together limestone, sandstone, brick or concrete.
   Heating - Heat limestone and drop it in ice water. It should crack or break.
   Freezing - Freeze water in a plastic jar. What happens? Water trapped in rock freezes and rock breaks into smaller and smaller pieces.

2. Talk to your art instructor about correlating art projects with clay, sand jars, sand paintings, etc.

INTERDISCIPLINARY CONNECTION

Art, language arts, mathematics.

Name_____

Date_____

SOIL IS MORE THAN DIRT

What is really this stuff called soil? Soil is much too precious to just call it dirt. Whenever you step outside, the soil beneath your feet is full of life. It is the home for creatures such as microbes, moles, ants, and earthworms.

WHAT IS IN THE SOIL?

The prairie soil has as many as 641,000 fungi and more than 20 million bacteria per acre that break down dead plant and animal materials into important nutrient elements, such as carbon and nitrogen, to help plants grow.

The soil is a refuge for animals like the deer mouse that builds its small nest underground and hoards seeds for winter use in burrows near its nest. The Franklin's ground squirrel, on the other hand, hibernates in its burrow throughout the winter months. Many birds, reptiles, and amphibians find refuge and/or food in the soil.

HOW IS SOIL FORMED?

Soil is formed by five soil-forming factors: climate, organisms, topography, parent material and time. Soil is formed very, very slowly. Soil is formed in

two ways, building-up and breaking-down. Rock, debris, sand-silt, and clay-sized particles, are transported and deposited by water (called sediment), ice (glacial drift), and/or wind (loess). These deposits together with out croppings of bedrock, form the topography or landscapes of the earth's surface. These are the parent materials from which soil forms. Continued weathering or breaking down of these parent materials by interactions of climate and organisms over long periods of time creates soil. As plants and animals decay, they also become part of the soil. The minerals of the soil come from the roots of the plants, leaves, twigs, insects, and other animals and organisms that are decomposed.

WHAT IS THE COMPOSITION OF SOIL?

A soil profile is a slice of earth several inches or feet deep. Most soil profiles have a surface layer of organic material and two or three layers of mineral materials.

The TOPSOIL is the upper 6 to 10 inches of soil. It contains most of the soil's living organisms, and it is rich in nutrients. The dark colors come from rotting organic matter, plants, and animals. This highly decayed matter from dead plants and animals is called "humus." Humus keeps the soil loose. It is like a sponge that absorbs water and holds it for plants to use. The plants, roots, bacteria, fungi, and small animals are abundant here.

The SUBSOIL holds water and some plant nutrients, but it is less fertile than the topsoil. It is good for growing plants. It is clay-like, usually harder and stickier when wet than the surrounding soil layers. It contains lesser humus, roots and organisms.

The PARENT MATERIAL is the weathered rock, partly weathered soil from which the soil layers were formed. Parent material can be rocks, materials left by the glaciers, materials left by wind and water, or even organic matter such as plants.

The size of soil particles is important. The amount of open space between the particles has a lot to do with how easily water moves through soil and how much water it holds. Too much clay (smallest soil particle) in proportion to silt (medium-sized particles like flour, when you rub it) and sand (largest of the soil particles that allow water to pass through easily) causes soil to take in water very slowly. The soil that has a favorable proportion like 27% clay, 50% sand and the rest silt is a good example of a loam soil.

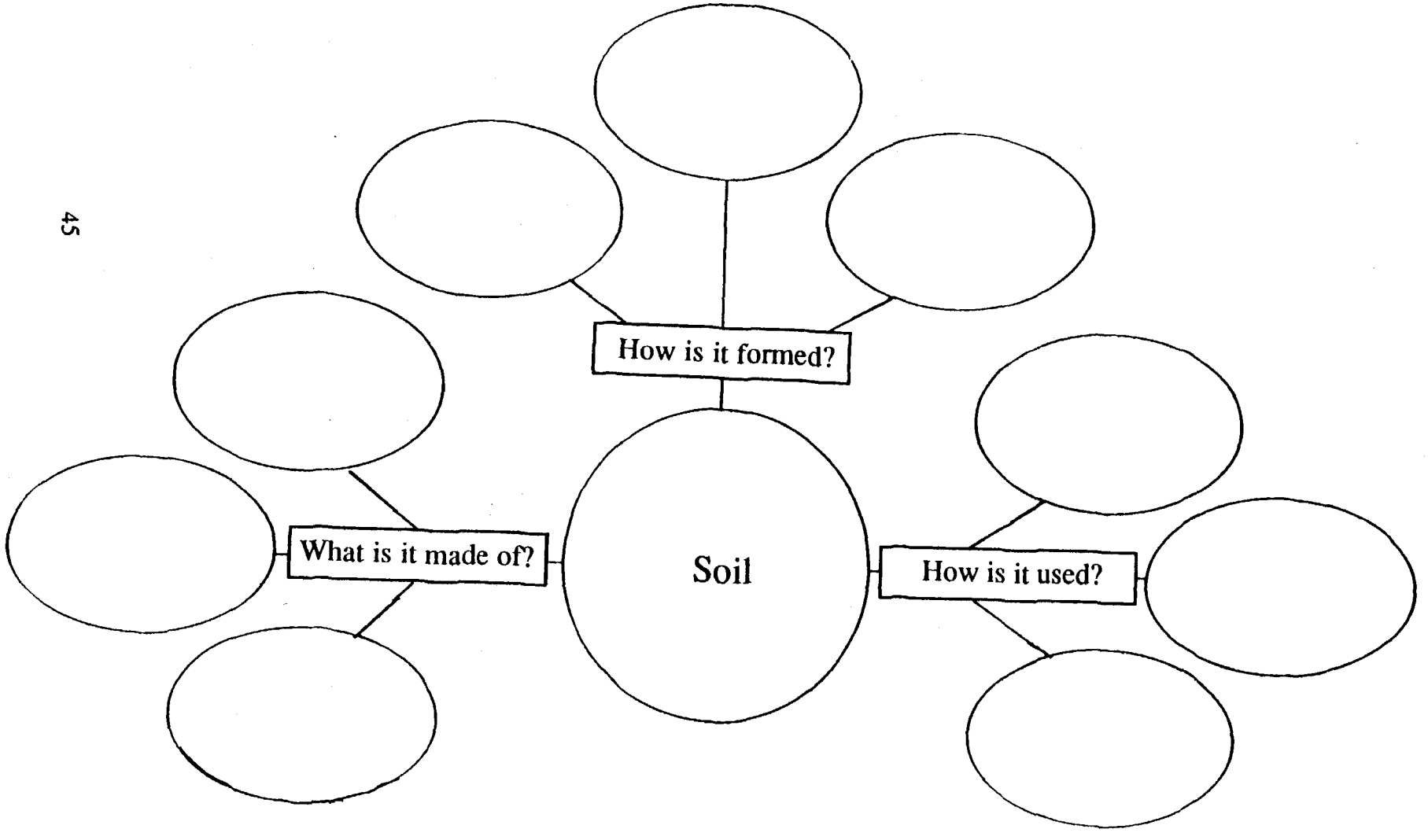
Most of Illinois prairie is now used as farmland where the prairie grasses and forbs have been replaced with corn, soybeans and wheat. Beneath the farmland, the prairie soil exists. This black soil is excellent for plants. Illinois' rich soil is a gift from its prairies that helps feed people all over the world.

Soil Word Web

Name_____

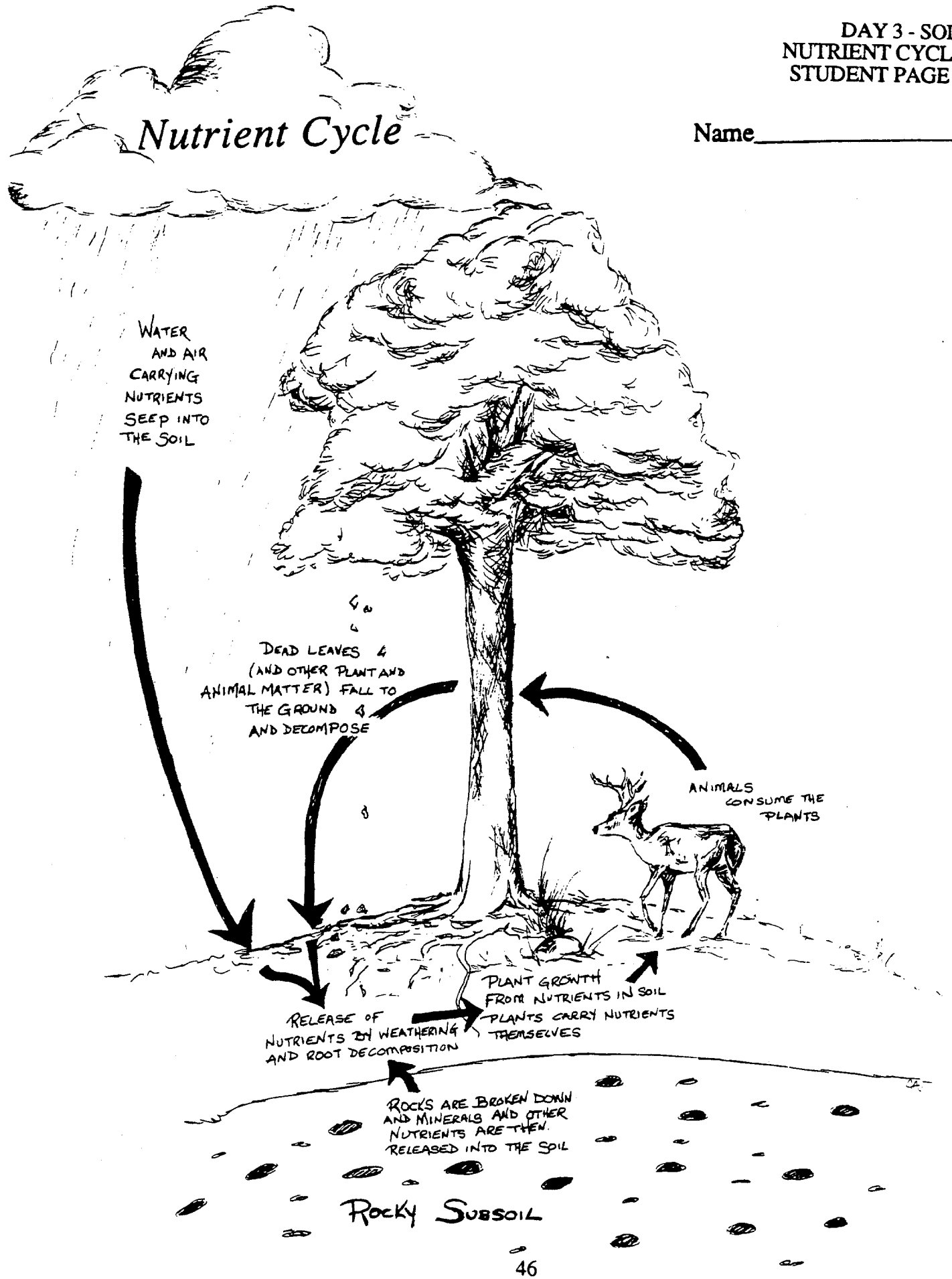
Write three answers to each question.

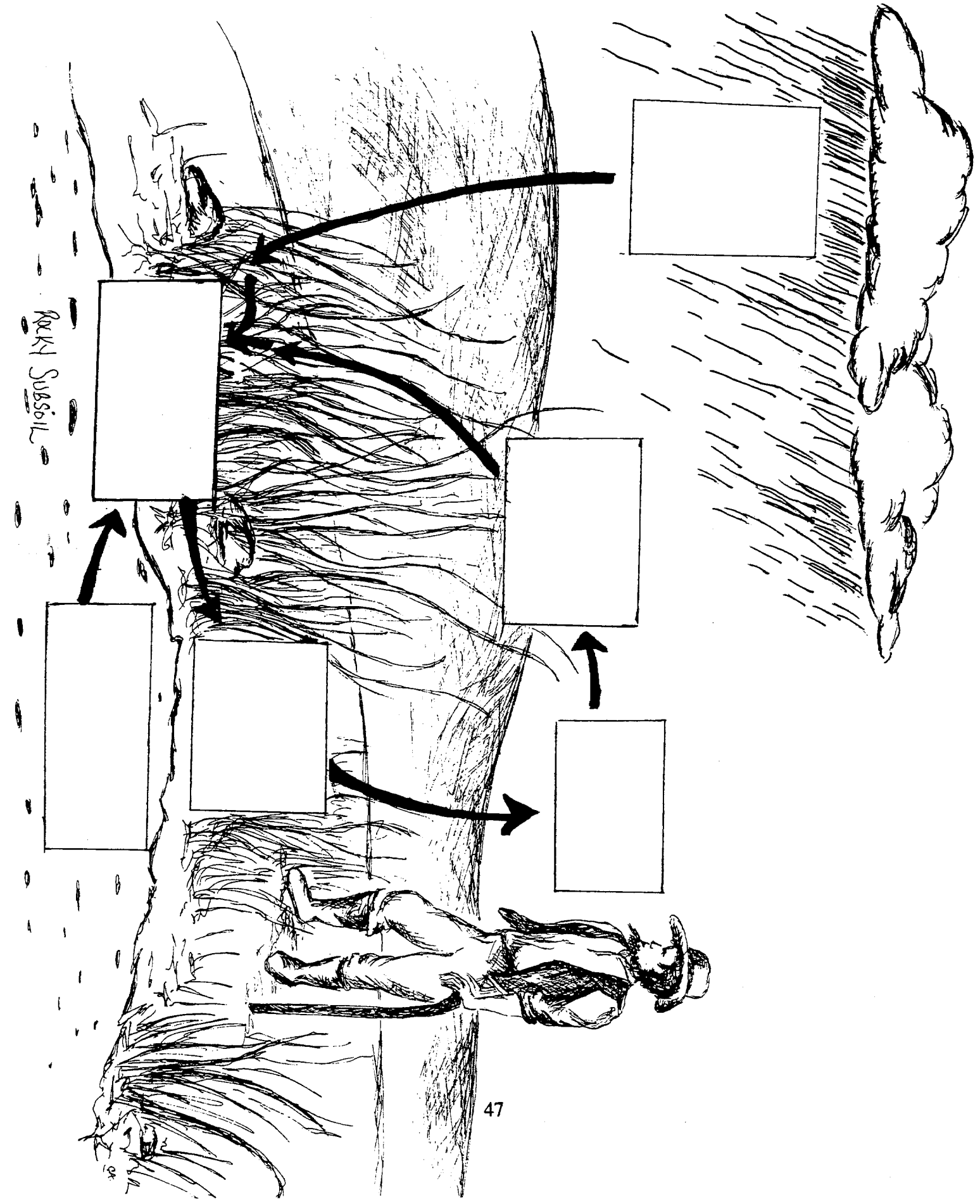
Date_____



Nutrient Cycle

Name_____



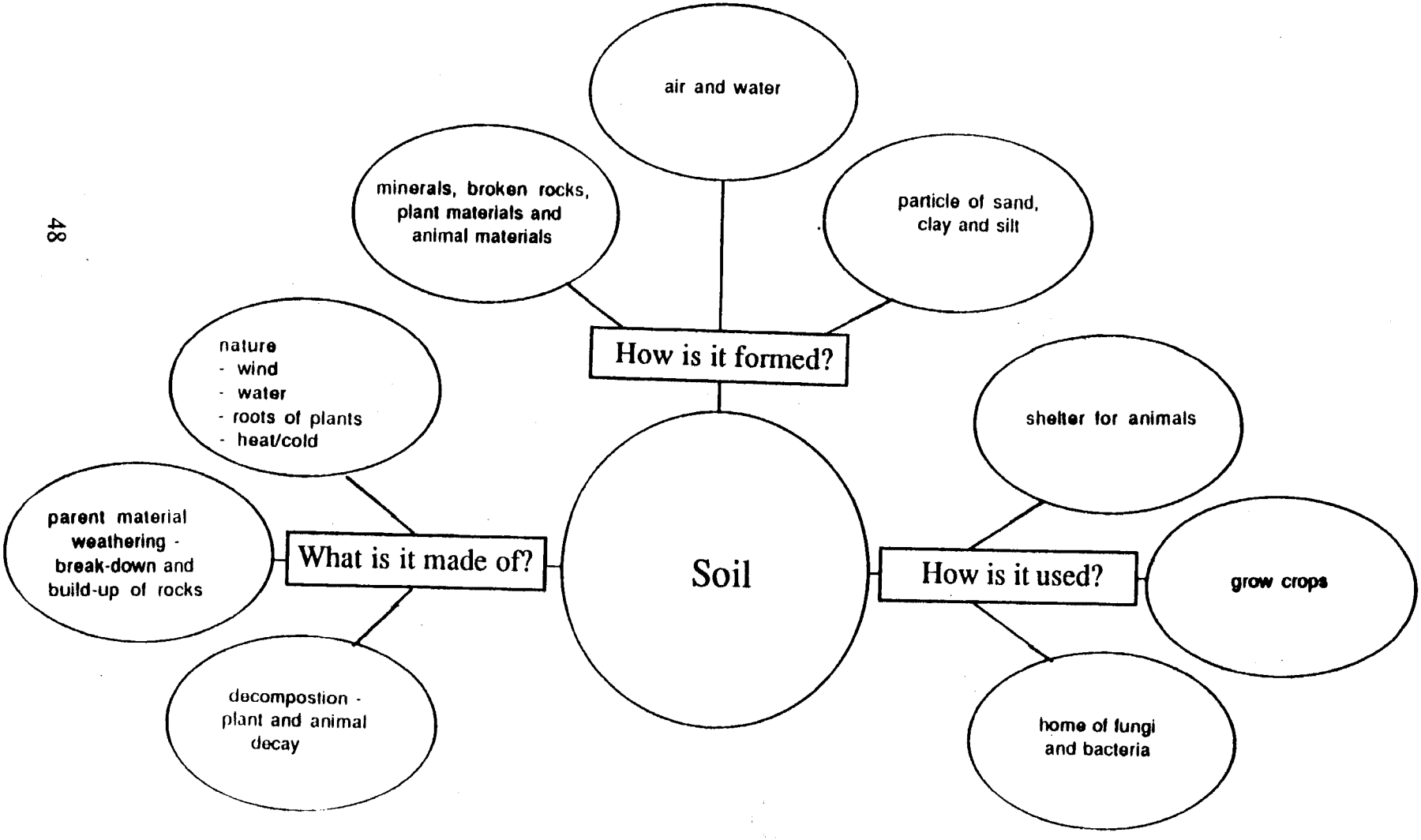

ROCKY SUBSOIL

Soil Word Web

Name_____

Write three answers to each question.

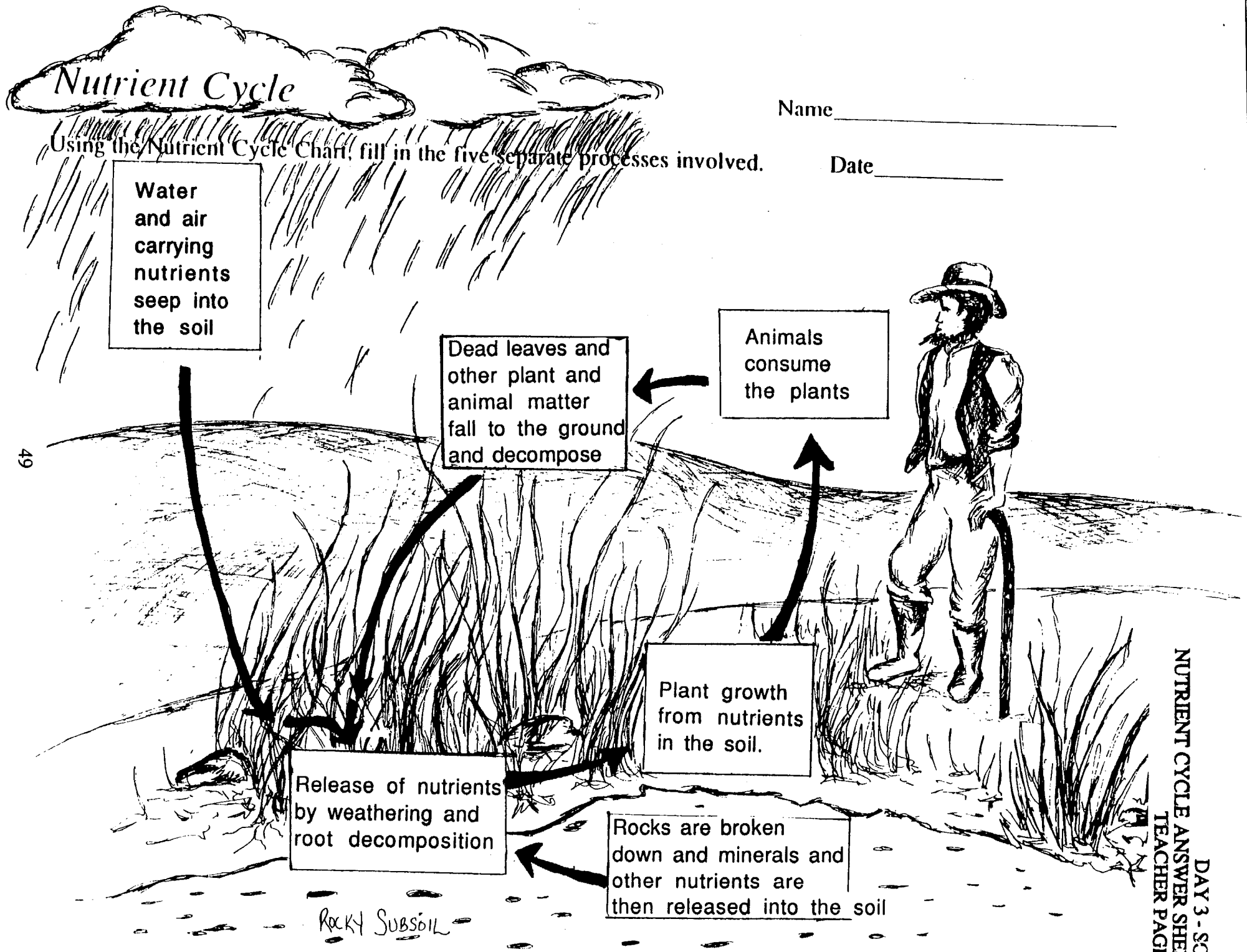
Date_____



Nutrient Cycle

Name_____

Using the Nutrient Cycle Chart, fill in the five separate processes involved. Date_____



Dirt Cake Recipe

Prepare the following cream cheese mixture.
Beat until creamy:

1 cup powdered sugar
1 - 8 oz. package of cream cheese
1/2 stick butter

Set Aside.

Prepare the following chocolate pudding mixture.
Mix until thick:

2 large packages of instant chocolate pudding
3 1/2 cups milk

Refrigerate.

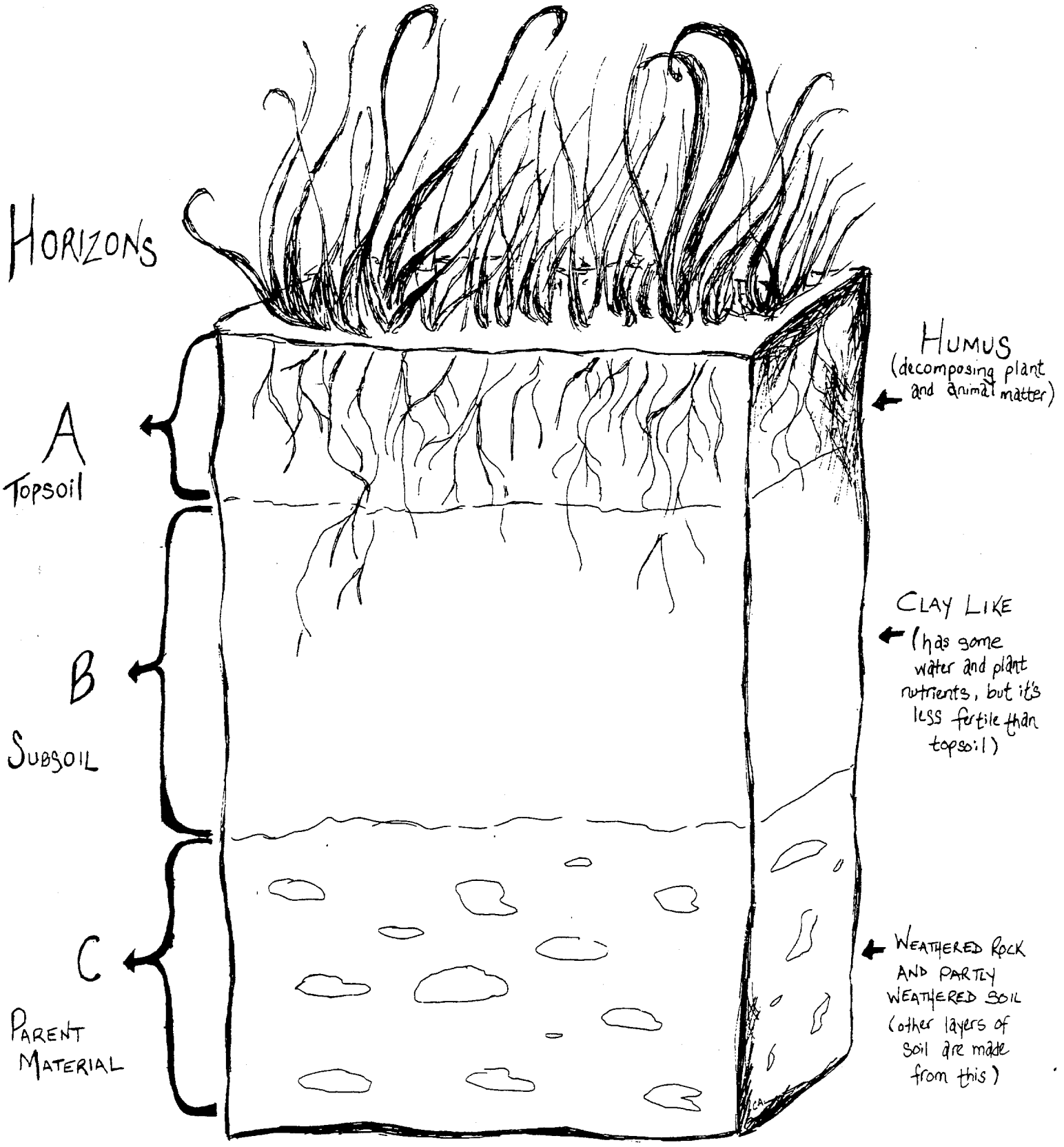
Using an electric blender (you may do this manually as well), break up a 20 oz. package of oreo cookies until they have the same appearance as dirt.

Mix the cream cheese mixture and the chocolate pudding with 8 oz. of cool whip.

In a large container (A CLAY FLOWER POT WILL WORK!), layer the ingredients.
Add:

1/3 of the cookie crumbs in the bottom of the pot.
1/2 of the pudding mixture.
Another 1/3 of the cookie crumbs.
The remainder of the pudding mixture.
The remainder of the cookie crumbs.
Decorate with plastic or real flowers. Gummy worms may be an additional pleasant touch.

DAY 3 - SOIL
TRANSPARENCY MASTER
SOIL PROFILE



DAYS 4 & 5: PRAIRIE ANIMALS

OBJECTIVES

The students will:

1. Become familiar with amphibians and reptiles, birds and mammals of the prairie and the roles they play in the ecosystem.
2. Identify the importance of insects and other invertebrates in the prairie ecosystem.
3. Contrast positive and negative influences of amphibians, reptiles and birds upon the environment.
4. Describe the predator/prey relationship within the prairie ecosystem.
5. Understand food webs.
6. Develop a base of knowledge to be able to make sound ecological decisions.

BACKGROUND

Amphibians and reptiles are both cold-blooded animals. Their body temperatures fluctuate based upon the temperature of the environment around them.

Amphibians: There are three basic groups of amphibians: salamanders, frogs/toads and the Caecilians - living fossils that are limbless, earless, almost blind and earthwormlike. They all differ from reptiles in that they never have true clawed feet or a scaly skin.

Amphibians and reptiles significantly contribute to the prairie ecosystem. As predators, they help control the insect population, and as prey, they become food for birds and mammals in addition to other reptiles. Amphibians do not have scales and spend part of their life in a fishlike "tadpole" stage.

Reptiles: Reptiles can be found in every state and are classified into four major groups: turtles, lizards, snakes and alligator/crocodiles. All reptiles have lungs and breathe air. Their skin is usually covered with scales or plates. Most reptiles lay eggs, however, in a few the eggs develop inside the female, and the young are born alive.

Birds: When students become really interested in birds, there's nothing like the thrill of seeing a beautiful bird, observing behavior, learning the importance of birds in the world of wildlife, and how they help control insect population.

Prairie grasses hide many ground-nesting birds, including meadowlarks, bobolinks, sparrows, larks and burrowing owls who nest under the prairie, usually in the deserted burrows of badgers or squirrels.

An important part of the prairie includes the birds of prey circling and diving for their next meal. The open field hunters include marsh hawks, red-tailed hawks, prairie falcons, eagles and turkey vultures (who scavenge the leftovers of the hunters).

It is important to remember that most birds do not remain in the prairie throughout the entire year. However, when present, they provide an intricate function in the prairie ecosystem. They help control insects, disperse seeds and provide a source of food for larger carnivorous birds.

Insects and Other Invertebrates: Life exists above, on and below the ground in the prairie. This aspect of study will concentrate on life on the ground in the form of insects and other invertebrates. Insects are remarkable animals. They occur almost anywhere, and they make up

more than half of all living things on this planet. They exhibit some unusual physiological and structural peculiarities.

Insects and other invertebrates play an important role in the prairie ecosystem. Some are destructive, some annoying, but they all play one of four extremely important functions: pollination, food processing, decomposition and soil tillage. You can find millions of insects on the prairie, so it would be impossible to give a comprehensive list.

The interdependence among species found within the prairie ecosystem is astonishingly important. If left totally unchecked, two flies could produce, in a single year, a ball (packed a thousand flies to the cubic inch) 96 miles in diameter.

Mammals: The mammals covered in this lesson include two distinct divisions. One group includes those mammals which once lived on the vast prairies, and the other includes those which lived on the prairie in the past and in the present. It is important for students to realize that when they visit a current prairie plot, they probably will not find bison, elk, bear, mountain lions, bobcats or wolves. Depending upon the size and location of prairie "museums," a vast variety of mammals can be found.

Mammals of the prairie can be classified as those which typically run or burrow. These animals learn to develop certain adaptations which allow them to survive. Ground squirrels burrow in the ground, which creates an ideal habitat for prairie life. Jackrabbits, deer and antelope depend upon speed for survival.

The dominant carnivorous animals of the prairie were bears and wolves. The removal of these animals makes it difficult to control some mammal populations on the prairie. Large restoration projects have experienced some difficulty maintaining the natural balance of species. The return of coyotes, fox, weasels and badgers has helped to facilitate the proper predator/prey relationship.

Each animal of the prairie has developed its own niche which has allowed it to survive. Burrowing animals have been able to coexist with prairie fires finding safety underneath the cool ground, while the surface temperature can reach 400 degrees within minutes. These adaptations for survival should be stressed as the animals of the prairie are studied. The interrelationships and interdependence found among species on the prairie, creating a workable food web, is an extremely important process.

The introduction of anthropomorphism is effective in teaching the necessity for death to occur in nature which allows life to exist. The death of plants, herbivores, carnivores and omnivores is key to the process of species survival.

MATERIALS

* Book, *Addie Across the Prairie*
  Journal
  Prairie mural construction materials
  Overhead projector
  Wire hangers
* Student pages - *Prairie Amphibians and Reptiles*
  Prairie Amphibian and Reptile Coloring Sheet
  Prairie Birds
  Prairie Birds Coloring Sheets
  The Marsh Hawk
  Prairie Insects
  Prairie Insect Coloring Sheets

* Student Pages - *Prairie Mammals*
  Food Web
* Teacher pages - *Prairie Amphibians and Reptiles Answer Sheet*
  Prairie Birds Answer Sheet
  Prairie Insects Answer Sheet
  Prairie Mammals Answer Sheet
* Transparency Masters - *Prairie Amphibians and Reptiles (1)*
  Prairie Birds (4)
  Prairie Mammals (4)
* Identification Cards - *Birds and Insects*

Starred (*) materials are included in this packet.

VOCABULARY

amphibians: Animals who live on both land and water and have smooth, moist skin without hair or scales. They go through a metamorphosis to become adults.

anthropomorphism: Projecting human feelings onto animals. A good example would be people feeling sorry for the bunny rabbit caught by the hawk.

carnivores: Meat eaters.

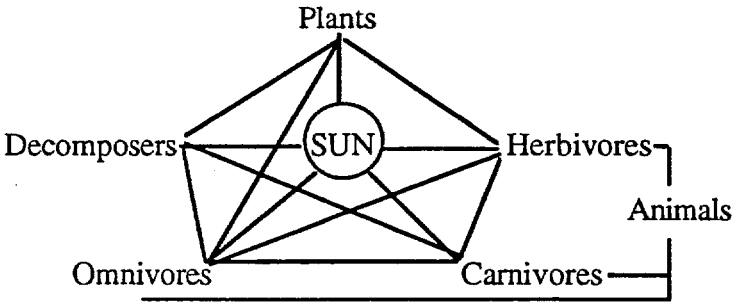
cold-blooded: Having blood that varies in temperature with the outside air, water or land.

decomposers: The animals, plants and microorganisms which break down dead plants and animals. This process enriches the soil.

decomposition: The breaking down of dead things into smaller parts or elements.

ecosystem: Living and nonliving things existing cooperatively.

food web/food cycle: A series of interrelated food chains. For example, plants are eaten by carnivores (meat eaters). Plants and animals can be eaten by omnivores (plant and meat eaters), all of which will eventually die and be eaten by decomposers thus continuing the cycle.



Use food web chart to help clarify.

herbivores: Plant eaters.

insect: A group of small, air-breathing arthropods (invertebrates with jointed legs) with a body clearly divided into three segments (head, thorax, abdomen). Insects have only three pairs of legs.

interdependence: Living and nonliving things relying on one another in an ecosystem.

invertebrates: Animals without backbones.

mammals: Warm-blooded animals, with hair, which usually bear their young live. The females have the capability to nurse their babies.

metamorphosis: The process of change. A change in appearance as an insect becomes an adult.

niche: The special role a species plays in an ecosystem.

nymph or larva: The young of an insect before metamorphosis.

omnivores: Plant and animal eaters.

pollination: The transfer of pollen for the fertilization of plants.

predator: The hunter.

prey: The hunted.

reptile: Cold-blooded animals that produce eggs which hatch into young. These young are miniature replicas of the adults (color may change).

scavengers: Animals that clean up food scraps.

PROCESS

Observing, discovery, inquiry, critical thinking, researching, application, report writing, public speaking, cooperative learning, concept application.

PROCEDURE

This lesson is a four-part, two-day lesson on the animals of the prairie.

1. Prairie Mural (continued):
   Divide the students into five separate cooperative groups: amphibians, reptiles, birds, insects and mammals. Over the next two days, background information will be presented which will allow the students to begin their individual research on their subgroup. They will also begin construction of the life-size animals utilizing the enclosed transparencies. Students may need assistance with the creation of life-size drawings.

2. Introduce the *Prairie Amphibians and Reptiles* student pages. For the students who were assigned to this facet of creating the classroom prairie, explain the task of creating life-size reptiles and amphibians which can be placed in the classroom restored prairie. Individual students (or cooperative groups) should research amphibians and reptiles of their choice as they become specialists in their area.

   Introduce *Prairie Birds* student pages. Individual students (or cooperative groups) should research birds of their choice to become specialists in their area. Have the students who were assigned to the bird facet of creating the classroom prairie make the life-size birds. (Students will need to consult an encyclopedia for color.) The birds can be hung from the ceiling and placed upon prairie grasses for authenticity.

Students will also begin to research and create the insects and other invertebrates found on the *Insect Identification Card* for placement in the classroom prairie.

Introduce the *Prairie Insects* student pages. They may be used in a variety of ways: by the small group exclusively, with the whole class with small group assistance, or solely as a whole-class activity. The activity sheet can be given to the class following the construction of the classroom prairie environment.

Introduce *Prairie Mammals* student pages. For the students who were assigned to the mammal facet of creating the classroom prairie, explain the task of creating life-size mammals which can be placed in the classroom restored prairie. The animals which live beneath the surface can be placed near the entrance to their burrow or their habitat could be shown using separate drawings. The enclosed transparencies will be helpful in creating the life-size drawings. Individual students (or cooperative groups) should research mammals of their choice as they become specialists in their area.

3. The *Bird Identification Card* has been provided as a field guide should a field trip to a prairie become an aspect of this project. Many of these birds may also be observed (depending upon your location and time of year) near your school or students' homes.

4. Group Research - Reports:
   Reports can become process writing exercises to be presented visually and/or verbally to other students. Students can also attempt to reproduce the sounds made by each animal as an enrichment activity.

5. Insect Classification:
   THE DAY BEFORE instruct each student to catch and bring an insect to class.

6. Divide the class in groups of four or five. Have each student in the group identify a characteristic that can be used to group "like" insects. Instruct students to list the characteristics on a sheet of paper and write the names of the insects (the name of the student if they do not know the name of the insect) that fall into that group.

7. When all students have completed their classification, record appropriate responses on the board or overhead. Did everyone categorize in the same manner? Why or why not? Was anyone wrong? List three ways we classify items in our daily lives. Why might classification be important in science?

8. Continue ongoing activities.

ALTERNATE LESSON PLAN

1. Another option for presenting the prairie insects, birds, amphibians, reptiles and mammals segments of this project is to utilize whole-class instruction for the student worksheets.

2. Present the background information for each segment to the entire class. Present the student worksheets to the entire class, discuss and complete all together. It is important to note that if this option is chosen, it may take longer than ten days to complete the entire unit.

EXTENSION ACTIVITIES

Many activities can be found in "Project Wild."
The starred (*) items can be found in the "Extension" section of this unit.

Reptiles and Amphibians

1. Project Wild *Changing Attitudes.*

2. Project Wild *First Impressions.*

3. Project Wild *Cartoons and Bumper Stickers.*

Birds

1. Take a field trip to a prairie to observe birds.

2. Have students observe birds around their school or home and graph results and observations.

3. Draw sketches of birds observed.

4. Project Wild *Seed Need.*

5. Project Wild *Deadly Links*

Insects and Other Invertebrates

1. Project Wild *Interview a Spider* .

*2. Gummy Worm Lab.

3. Collect insects using a field net.

4. Purchase mealworms to observe the metamorphosis process.

Mammals

1. Take a field trip to a prairie to observe mammals. A zoo will provide opportunities to safely observe prairie mammals as well.

2. Have students observe mammals around their school or home and graph results and observations.

3. Draw sketches of animals observed.

4. Make entries into journals about the life of various mammals. What would it be like to be a predator or prey?

5. Project Wild *Oh Deer* .

6. Project Wild *Foxes and Rabbits* .

7. Project Wild *What Bear Goes Where.*

8. Project Wild *Muskoxen Behaviors* can be adapted to Buffalo Behaviors. This activity is excellent for teaching the predator/prey concept.

*9. *Animal Sounds, The Right Words, and Animal Groups.*

*10. *Deer Stalking*

General Animals
*1.*Creative Writing* activity sheet.

*2. *Pantomime of Nature Objects* activity.

*3.*V.I.P.'s in Nature* activity.

INTERDISCIPLINARY CONNECTION
Art, language arts, mathematics, science.

ASSESSMENT
(Answer are italicized and refer to the Student Pages indicated below. Answers are also included on the corresponding teacher answer pages.)

Prairie Amphibians and Reptiles (p. 58 - 60)

1. Name one thing some amphibians add to the prairie scene. *(Music; variety)* Explain how amphibians exist in two forms? *(First they are a larva and then become an adult.)* Do reptiles exist in these two forms? *(No)*

2. List locations for shelter.

Name	Adult	Egg	Larva
Blue racer	*rock, shrub, water*	*rock*	
Ornate box turtle	*shell, burrow*	*soil*	
American toad	*grass*	*pond bottom*	*water*
Western fox snake	*grasses, tree bark*	*soil beneath rock*	
Small-mouthed salamander	*soil beneath rocks*	*aquatic plant*	*water*
Bull snake	*grass, burrows*	*rock*	
Gopher frog	*soil beneath pond, crayfish hole*	*aquatic plant*	*water*
Six-lined racerunner	*rock*	*soil*	

3. Label each illustration. Answers given from left to right, the top row followed by the bottom row.
Ornate box turtle, Blue racer, Western fox snake, Small-mouthed salamander
American toad, Six-lined racerunner, Gopher frog, Bull snake.

Prairie Birds (p. 65 - 67)

1. List type of feeder and location of nest.

Name	Feeder	Nest
Mourning dove	*herbivore*	*shrubs or trees*
Upland sandpiper	*omnivore*	*ground*
Canada goose	*herbivore*	*ground near water*
Dickcissel	*omnivore*	*on or near ground*
Killdeer	*carnivore*	*small hollow on ground*
Eastern meadowlark	*omnivore*	*ground*
Prairie chicken	*omnivore*	*ground*
Loggerhead shrike	*carnivore*	*shrub or small tree*
Turkey vulture	*carnivore*	*ground*

Short-eared owl	*carnivore*	*ground*
Marsh hawk	*carnivore*	*ground*

2. Identify the illustration. Answers given from left to right working down the page.
Dickcissel, Killdeer
Upland sandpiper, Canada goose, Mourning dove
Eastern meadowlark, Turkey vulture
Prairie chicken
Short-eared owl, Loggerhead shrike, Marsh hawk

Prairie Insects (p. 82 - 84)

1. Name the most common insects of the prairie. *(Grasshoppers, wasps, flies, ants, bees, dragonflies, termites, beetles, aphids, butterflies, moths and flies)* Explain how nymphs mature into adults and how larva mature into adults. *(Nymphs mature into adults through a process called incomplete metamorphosis and go through a series of molts. Larva mature into adults through a process called complete metamorphosis where larvae first go through a series of molts and then a pupal stage where the transformation is completed.)*

2. Insect tasks.

Insect	Task
Flesh fly	*Adult 1; Larva 3*
Robber fly	*3*
Least skipper butterfly	*1, 3*
Painted lady butterfly	*1*
Spotted cucumber beetle	*Adult 2, larva 3*
Digger wasp	*Adult 1, larva 2*
Aphids	*2*
Praying mantis	*2*
Least skipper caterpillar	*2*
Tumblebug	*3*

3. Label each insect. Answers are given from left to right and from top to bottom.
Digger wasp, Least skipper butterfly, Painted lady butterfly, Bumblebee, Praying mantis
Robber fly, Aphid, Tumblebug
Spotted cucumber beetle, Mound ant
Flesh fly, American carrion beetle, Least skipper caterpillar, Red-legged grasshopper

Prairie Mammals (p. 92 - 95)

1. Explain why some mammals are most important as sources of food for other animals. *(They are a vital source of food energy.)* Explain why some are most important as predators. *(They keep insect and rodent populations under control.)* Name two mammals that are important both as food sources and predators. *(Brown bat and Franklin's ground squirrel.)*

2. Describe the niche of the badger. *(Lives in burrows; Nest chamber; At night; Stalks prey at night; Ground Squirrels or mice; Man.)* Describe the niche of the red fox. *(At night; Prairie floor; Slow, deliberate steps, crouches and wiggles, then rushes and kills with powerful bite; Rabbits and mice; Underground den; One per year; Quick speed and cunning; Man.)* Compare niches. *(Both active at night; Badger stays in burrow and red fox stays in clump of grass; Badger fast and fox slow and deliberate; No; No.)*

3. Describe various niches. *(Answers readily available from text.)*

4. Label each mammal. Answers given from left to right and from top to bottom.
   coyote, red fox
   plains pocket gopher, least shrew, badger
   striped skunk, little brown bat
   prairie vole, eastern cottontail, Franklin's ground squirrel

Prairie Amphibians and Reptiles, *Prairie Birds, Prairie Mammals* and *Prairie Insects* sheets can be utilized as assessment tools.

The construction of animals for your prairie classroom can be included in accountability.

The students may be asked to report to the class, orally or in writing, as entomologists, birders, etc.

Students may be graded on their individual specimens and written/verbal reports to other students.

Students may be asked to respond to the following questions:

Describe the positive and negative influence of insects on the environment.

What would it be like to be a predator or prey?

The basic knowledge vocabulary can be included in a test or quiz.

The following list suggests journal ideas or topic questions.

- Amphibians and Reptiles - Compare and contrast these two groups.
  Imagine life as one of the animals and write about a typical day.
- Birds - If you could be a bird, which would you be? Which would you find easier, being a predator or prey? Explain why.
- Write about the life of various birds.
- Insects and Other Invertebrates - Write a newspaper advertisement promoting the positive aspects of an insect generally regarded as creepy or scary.
- Mammals - Write an Acrostic Poem using the name of a mammal.
  Example: Daring
  Eating leaves
  Evening meals in the prairie
  Running quickly away

Creative writing/lesson evaluation.

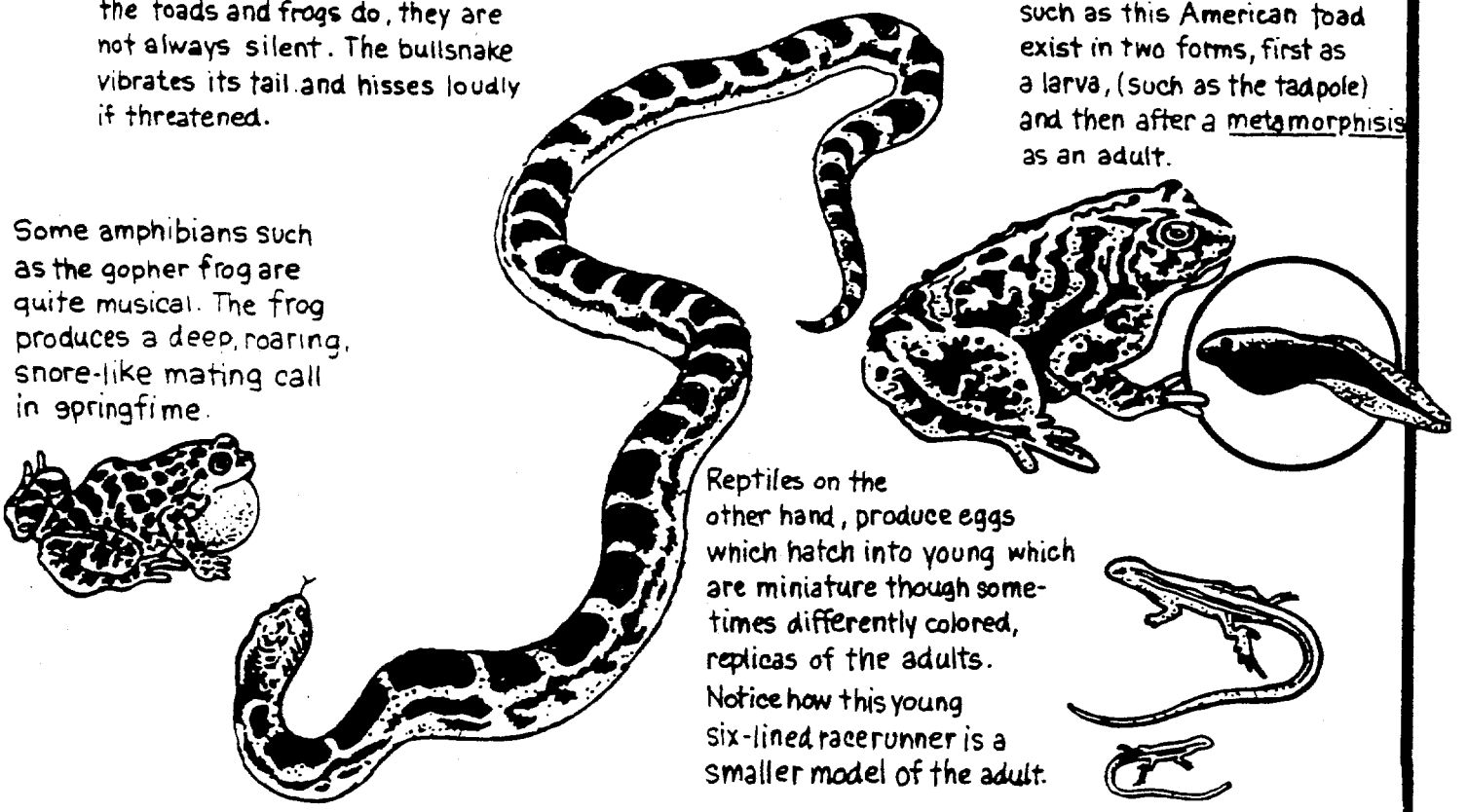
Prairie Amphibians and Reptiles:

Amphibians and reptiles bring music and variety to the prairie.

Though reptiles do not vocalize as the toads and frogs do, they are not always silent. The bullsnake vibrates its tail and hisses loudly if threatened.

Like insects, amphibians, such as this American toad exist in two forms, first as a larva, (such as the tadpole) and then after a metamorphisis as an adult.

Some amphibians such as the gopher frog are quite musical. The frog produces a deep, roaring, snore-like mating call in springfime.



Reptiles on the other hand, produce eggs which hatch into young which are miniature though sometimes differently colored, replicas of the adults. Notice how this young six-lined racerunner is a smaller model of the adult.

The Role of Amphibians and Reptiles in the Prairie Ecosystem:

Amphibians and reptiles have a great deal to contribute to the ecosystem. As predators, amphibians and reptiles help control the population of insects and rodents. As prey, they serve as food for birds, and mammals as well as other amphibians and reptiles.

The American toad preys upon the red-legged grasshopper, Food energy in grasshopper is transferred to the toad.

Working with Prairie Amphibians/Reptiles:

Work Step #1: Using the word picture at the top of this page as a guide, name one thing some amphibians add to the prairie scene. Explain how amphibians exist in two forms. Do reptiles?

Work Step #2: On page 62 are descriptions of eight prairie amphibians and reptiles. One thing all of these animals have in common is the need for adequate shelter. The adults need shelter for themselves and for their eggs. And when the eggs hatch, the young also need shelter. There are many different types of shelter available in the prairie ecosystem. Sometimes rocks and clumps of grasses provide shelter, other times water and soil provide the only shelter. After

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reading the description of each animal, write on the blank lines all of the locations wherein each animal finds shelter for itself, eggs and young. If there is more than one line, it means the animal finds shelter in more than one place. For example, the adult blue racer finds shelter in three different places but only one place is shelter for its eggs.

Work Step 3: On page 63 are illustrations of the eight amphibians and reptiles. Using the clues provided, label each illustration.

Blue racer: This slender blue snake has a white chin and throat and is from 36-60" long. This snake usually hangs out under a rock but will climb a shrub or take to the water if being pursued or searching for food. The racer preys upon insects, amphibians, reptiles and small birds and mammals. In June and July, the racer lays its 19 to 25 white eggs under a rock. Adult. _____ _____ _____ eggs _____

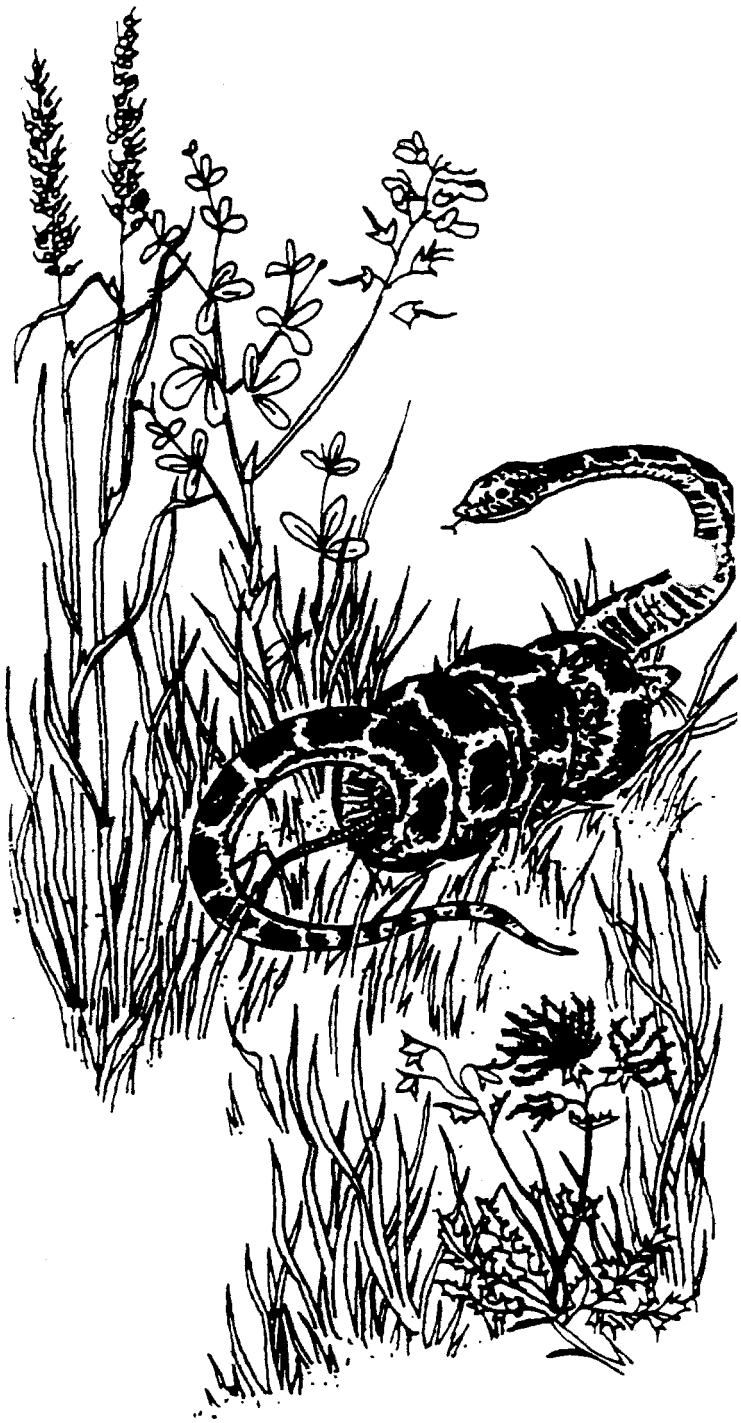
ornate box turtle: This dark brown, 4-5" long turtle is decorated with golden lines radiating outward from the middle of its shell. This turtle carries one of its shelters with it. If threatened, it pulls in its head and feet and closes its shell so tight the prying beak, claws or teeth of a predator cannot get through. During the spring of the year, the turtle crawls out of its burrow in the soil. By June and July, the female buries her clutch of eggs in the soil. The box turtle travels across the prairie floor in search of fungi, fruits, seeds and tiny animals. In the severe heat of midsummer, the turtle seeks refuge by burrowing into the soil. During fall, the turtle emerges again for several weeks, the young turtles hatch. But as the days turn colder, the turtle begins digging into the soil a short distance each day. By the time of the first freeze, the turtle has worked its way deep enough in the soil to avoid freezing. Adult: _____ _____ eggs _____

American toad: During the day, this 2-3½" brown to olive toad hides in the thick clumps of grass stems. At dusk, it ventures out to feed on insects and worms. The female lays several thousand eggs in long strings in the bottom of a prairie pond. In only a week's time, small, black tadpoles hatch. These tadpoles have gills and swim about like fish looking for tiny aquatic plants and animals for food. When they transform into adults, they lose their gills, breathe by lungs and live on land. Adult _____ eggs _____ tadpoles _____

western fox snake: This yellow-gray snake is marked by red-brown spots and grows to be 36-50" long. In search of small mammals and birds, the fox snake makes its way about the prairie floor. Occasionally, the fox snake rests hidden in a clump of grasses. Other times, the agile snake climbs a dead standing tree or stump at the edge of the prairie and finds shelter underneath the loose bark. The female snake lays her eggs in the soil beneath a rock and hatching occurs in late summer. Adult _____ _____ eggs _____

small-mouthed salamander: This 4½-7" salamander is named for its tiny mouth and head. Its skin is dark brown to black and marked by grayish-yellow patches. The adult salamander finds shelter in the soil beneath rocks. At night, it travels the prairie floor in search of earthworms, slugs and insects, sticking close always to the protective cover of the vegetation. During the spring the female finds a prairie pond or ditch and deposits a sticky mass containing 6 to 30 eggs onto the stem of an aquatic plant. The eggs hatch in a few days and the larvae stay in the water, often seeking shelter beneath rocks, until they are transformed into adults, usually by July. Adult: _____ eggs _____ larvae _____

bull snake: This large (50-72") yellowish snake is marked by darkly colored blotches. The powerful bull snake travels about the prairie in search of small birds and mammals. It ambushes its prey from a hiding place like a clump of grasses or mammal burrow. The bull snake squeezes its prey to death. The bull snake is a beneficial animal because it helps control the population of rodents. Eggs of the bull snake are often laid beneath a rock. Adult _____ _____ eggs



gopher frog: The spring mating season is the only time this creme colored frog marked with black spots ventures above ground. During the winter, the gopher frog hibernates in the soil beneath a pond. During summer and fall, the frog lives by day inside a crayfish hole dug into the bank of a pond. At night, the frog darts out to capture crayfish and aquatic insects. The female frog lays 5,000 eggs in shallow water and occasionally attaches the egg mass to the stems of plants. The larvae swim in the water, finding refuge from time to time under decaying vegetation until they have transformed into frogs by July. Adult _____ _____ eggs _____ larvae _____

six-lined racerunner: This olive-gray to brown lizard has six lightly colored stripes running from its head to the base of its tail. The 6-9½" racerunner is a real sun-lover and is often seen during the day basking on a rock. On cool days, the lizard seeks shelter beneath a rock. The racerunner is a quick predator and has little problem snagging spiders. The eggs on the racerunner are sheltered in the soil until they hatch in July. Adult _____ Eggs _____ .

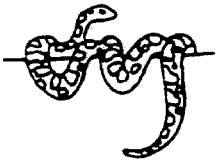
dark brown, gold lines on shell

_____

slender blue, white chin and throat

_____

yellow-gray, red brown spots



_____

dark brown to black, grayish yellow patches

_____

Prairie Amphibians and Reptiles

brown to olive, 2 to 3½" long

_____

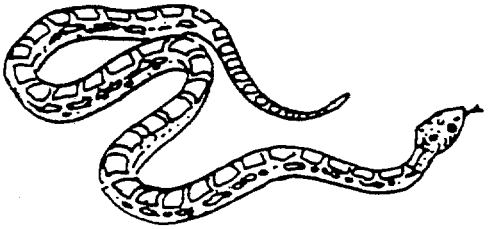
olive gray to brown, six stripes

_____

cream colored, black spots

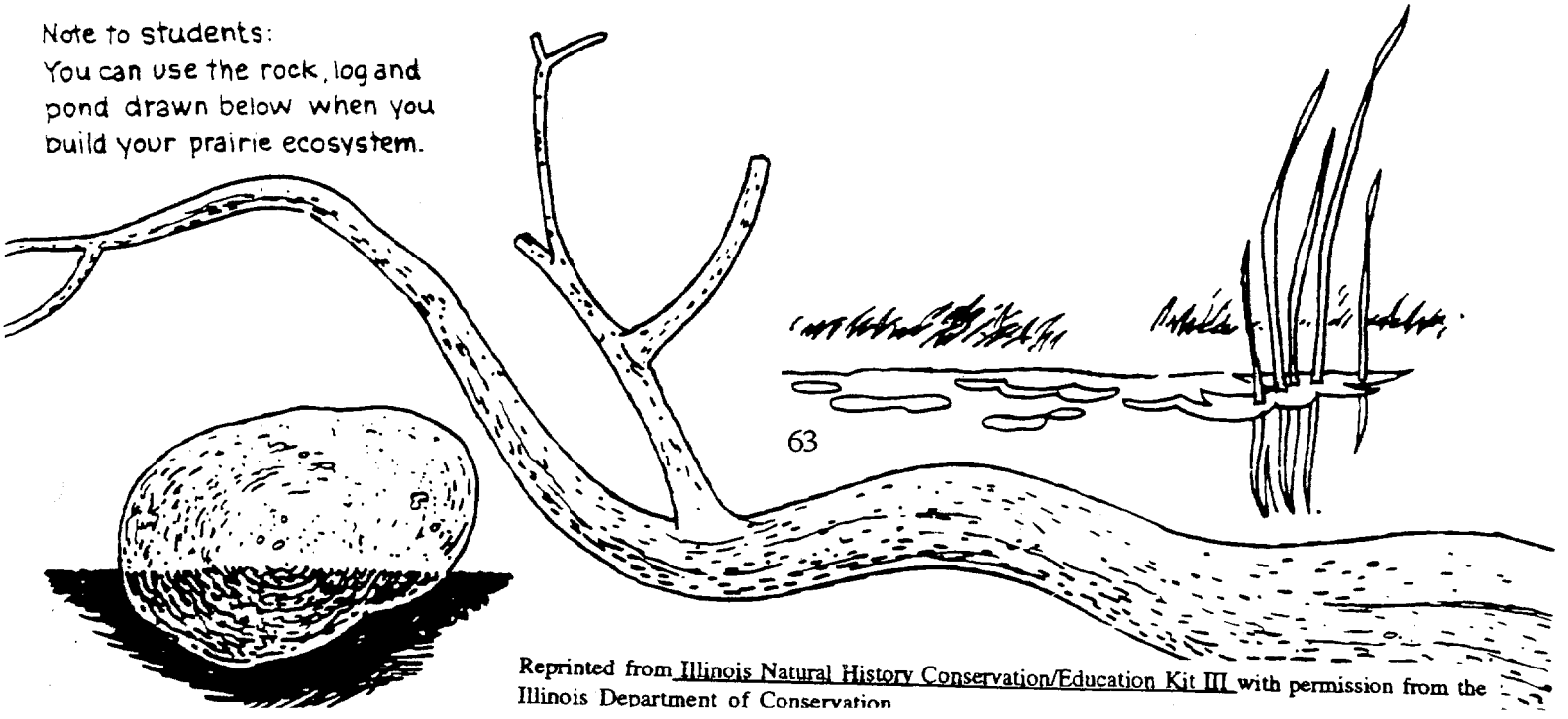
_____

50-72", yellowish, dark blotches

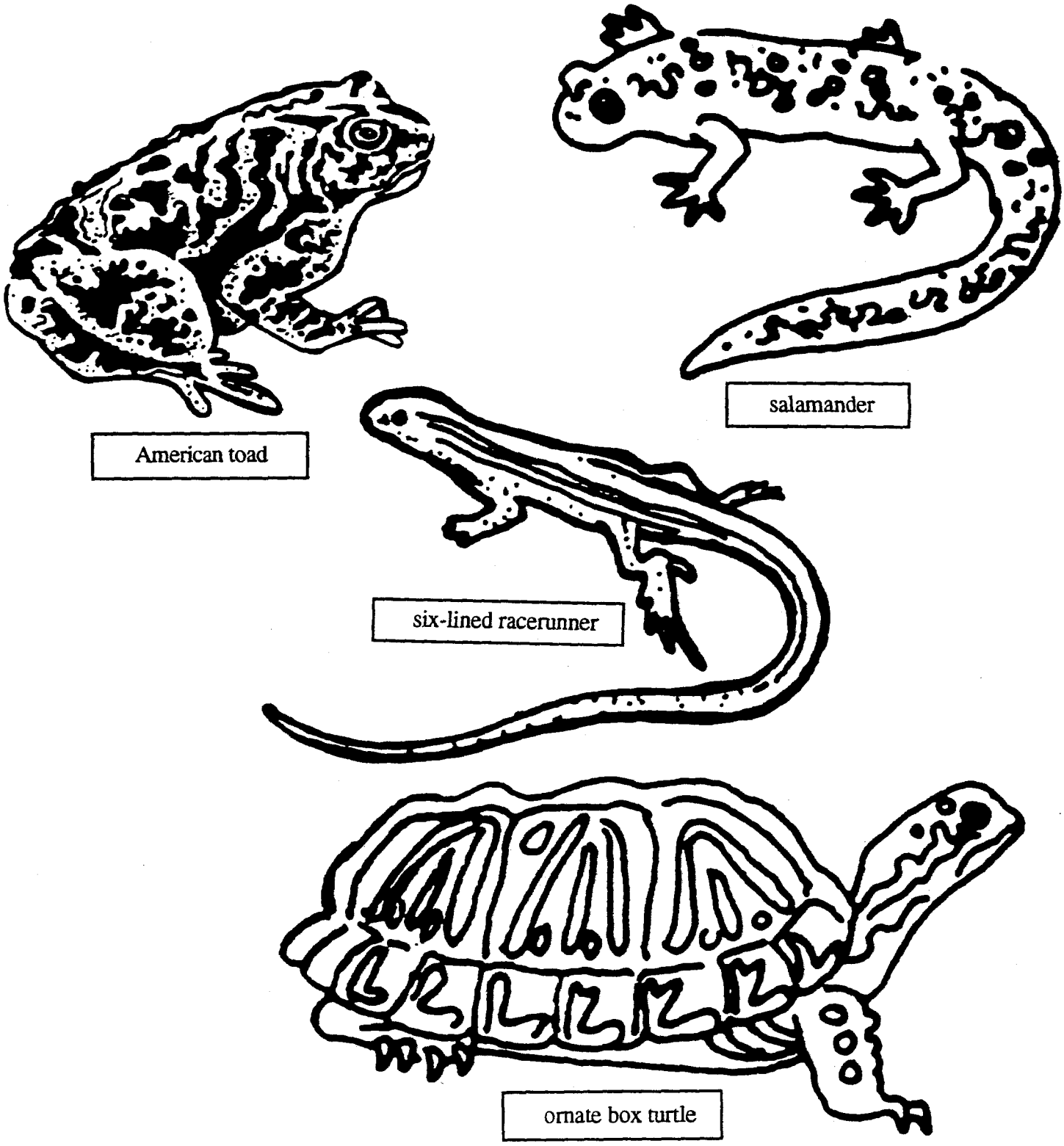


_____

Note to students:
You can use the rock, log and pond drawn below when you build your prairie ecosystem.



LIFE-SIZE COLORING SHEET



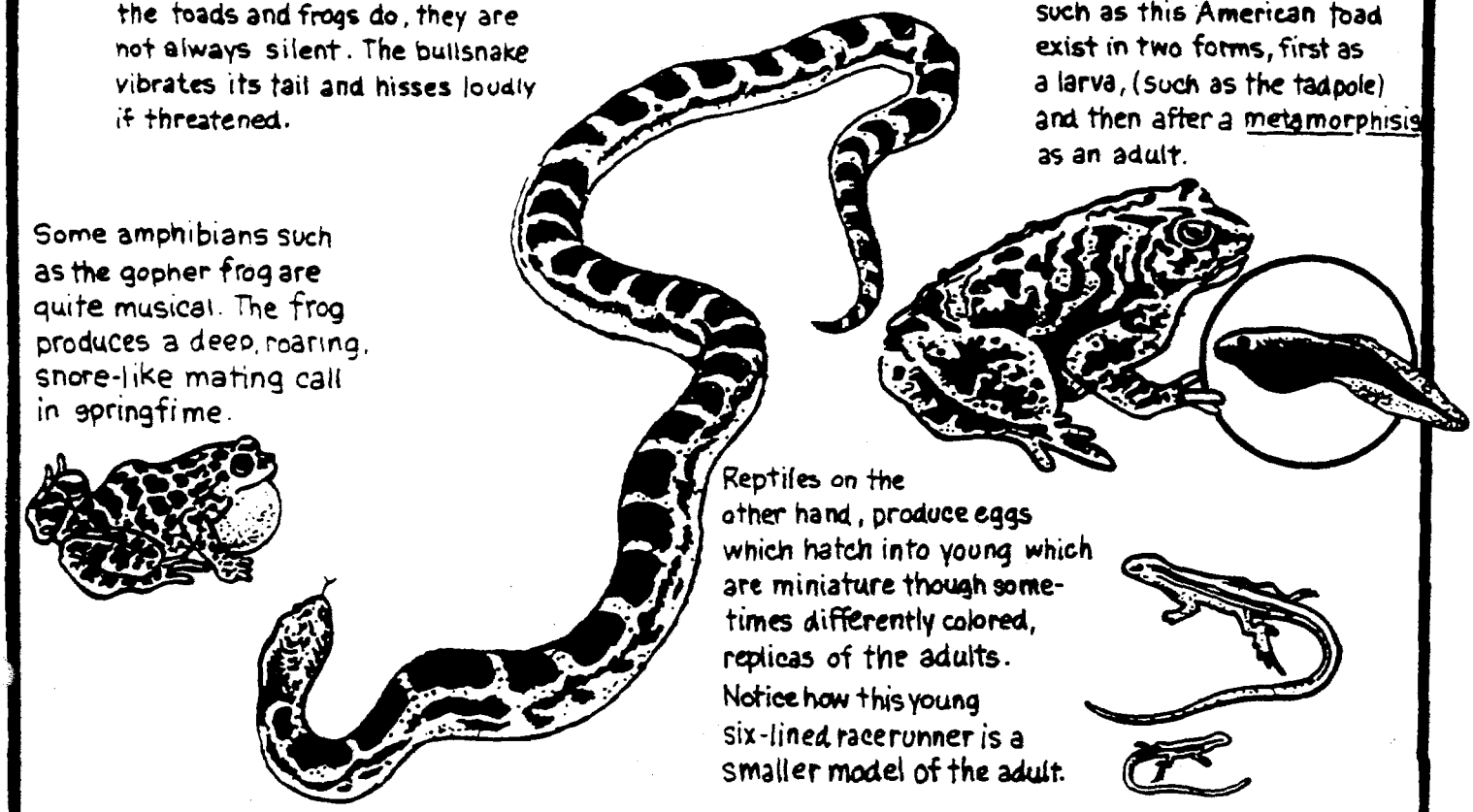
Prairie Amphibians and Reptiles:

Amphibians and reptiles bring music and variety to the prairie.

Though reptiles do not vocalize as the toads and frogs do, they are not always silent. The bullsnake vibrates its tail and hisses loudly if threatened.

Like insects, amphibians, such as this American toad exist in two forms, first as a larva, (such as the tadpole) and then after a metamorphisis as an adult.

Some amphibians such as the gopher frog are quite musical. The frog produces a deep, roaring, snore-like mating call in springfime.



Reptiles on the other hand, produce eggs which hatch into young which are miniature though sometimes differently colored, replicas of the adults. Notice how this young six-lined racerunner is a smaller model of the adult.

The Role of Amphibians and Reptiles in the Prairie Ecosystem:

Amphibians and reptiles have a great deal to contribute to the ecosystem. As predators, amphibians and reptiles help control the population of insects and rodents. As prey, they serve as food for birds, and mammals as well as other amphibians and reptiles.

The American toad preys upon the red-legged grasshopper. Food energy in grasshopper is transferred to the toad.

Working with Prairie Amphibians/Reptiles:

Work Step #1: Using the word picture at the top of this page as a guide, name one thing some amphibians add to the prairie scene. Explain how amphibians exist in two forms. Do reptiles?

Work Step #2: On page 66 are descriptions of eight prairie amphibians and reptiles. One thing all of these animals have in common is the need for adequate shelter. The adults need shelter for themselves and for their eggs. And when the eggs hatch, the young also need shelter. There are many different types of shelter available in the prairie ecosystem. Sometimes rocks and clumps of grasses provide shelter, other times water and soil provide the only shelter. After

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reading the description of each animal, write on the blank lines all of the locations wherein each animal finds shelter for itself, eggs and young. If there is more than one line, it means the animal finds shelter in more than one place. For example, the adult blue racer finds shelter in three different places but only one place is shelter for its eggs.

Work Step 3: On page 67 are illustrations of the eight amphibians and reptiles. Using the clues provided, label each illustration.

Blue racer: This slender blue snake has a white chin and throat and is from 36-60" long. This snake usually hangs out under a rock but will climb a shrub or take to the water if being pursued or searching for food. The racer preys upon insects, amphibians, reptiles and small birds and mammals. In June and July, the racer lays its 19 to 25 white eggs under a rock. Adult. rock shrub water eggs rock

ornate box turtle: This dark brown, 4-5" long turtle is decorated with golden lines radiating outward from the middle of its shell. This turtle carries one of its shelters with it. If threatened, it pulls in its head and feet and closes its shell so tight the prying beak, claws or teeth of a predator cannot get through. During the spring of the year, the turtle crawls out of its burrow in the soil. By June and July, the female buries her clutch of eggs in the soil. The box turtle travels across the prairie floor in search of fungi, fruits, seeds and tiny animals. In the severe heat of midsummer, the turtle seeks refuge by burrowing into the soil. During fall, the turtle emerges again for several weeks, the young turtles hatch. But as the days turn colder, the turtle begins digging into the soil a short distance each day. By the time of the first freeze, the turtle has worked its way deep enough in the soil to avoid freezing. Adult: shell burrow eggs soil

American toad: During the day, this 2-3½" brown to olive toad hides in the thick clumps of grass stems. At dusk, it ventures out to feed on insects and worms. The female lays several thousand eggs in long strings in the bottom of a prairie pond. In only a week's time, small, black tadpoles hatch. These tadpoles have gills and swim about like fish looking for tiny aquatic plants and animals for food. When they transform into adults, they lose their gills, breathe by lungs and live on land. Adult grass eggs pond bottom tadpoles water

western fox snake: This yellow-gray snake is marked by red-brown spots and grows to be 36-50" long. In search of small mammals and birds, the fox snake makes its way about the prairie floor. Occasionally, the fox snake rests hidden in a clump of grasses. Other times, the agile snake climbs a dead standing tree or stump at the edge of the prairie and finds shelter underneath the loose bark. The female snake lays her eggs in the soil beneath a rock and hatching occurs in late summer. Adult grasses tree bark eggs soil beneath rock

small-mouthed salamander: This 4½-7" salamander is named for its tiny mouth and head. Its skin is dark brown to black and marked by grayish-yellow patches. The adult salamander finds shelter in the soil beneath rocks. At night, it travels the prairie floor in search of earthworms, slugs and insects, sticking close always to the protective cover of the vegetation. During the spring the female finds a prairie pond or ditch and deposits a sticky mass containing 6 to 30 eggs onto the stem of an aquatic plant. The eggs hatch in a few days and the larvae stay in the water, often seeking shelter beneath rocks, until they have transformed into adults, usually by July. Adult: soil beneath rock eggs aquatic plant larvae water

bull snake: This large (50-72") yellowish snake is marked by darkly colored blotches. The powerful bull snake travels about the prairie in search of small birds and mammals. It ambushes its prey from a hiding place like a clump of grasses or mammal burrow. The bull snake squeezes its prey to death. The bull snake is a beneficial animal because it helps control the population of rodents. Eggs of the bull snake are often laid beneath a rock. Adult grass burrows eggs rock

gopher frog: The spring mating season is the only time this creme colored frog marked with black spots ventures above ground. During the winter, the gopher frog hibernates in the soil beneath a pond. During summer and fall, the frog lives by day inside a crayfish hole dug into the bank of a pond. At night, the frog darts out to capture crayfish and aquatic insects. The female frog lays 5,000 eggs in shallow water and occasionally attaches the egg mass to the stems of plants. The larvae swim in the water, finding refuge from time to time under decaying vegetation until they have transformed into frogs by July. Adult soil beneath pond Crayfish hole eggs aquatic plant larvae water

six-lined racerunner: This olive-gray to brown lizard has six lightly colored stripes running from its head to the base of its tail. The 6-9½" racerunner is a real sun-lover and is often seen during the day basking on a rock. On cool days, the lizard seeks shelter beneath a rock. The racerunner is a quick predator and has little problem snagging spiders. The eggs on the racerunner are sheltered in the soil until they hatch in July. Adult rock Eggs soil .

dark brown, gold lines on shell

ornate box turtle

slender blue, white chin and throat

blue racer

yellow-gray, red brown spots

Western fox snake

dark brown to black, grayish yellow patches

smallmouthed salamander

Prairie Amphibians and Reptiles

brown to olive, 2 to 3½" long

American toad

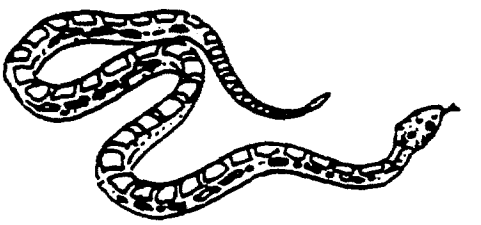
olive gray to brown, six stripes

Six-lined racerunner

cream colored, black spots

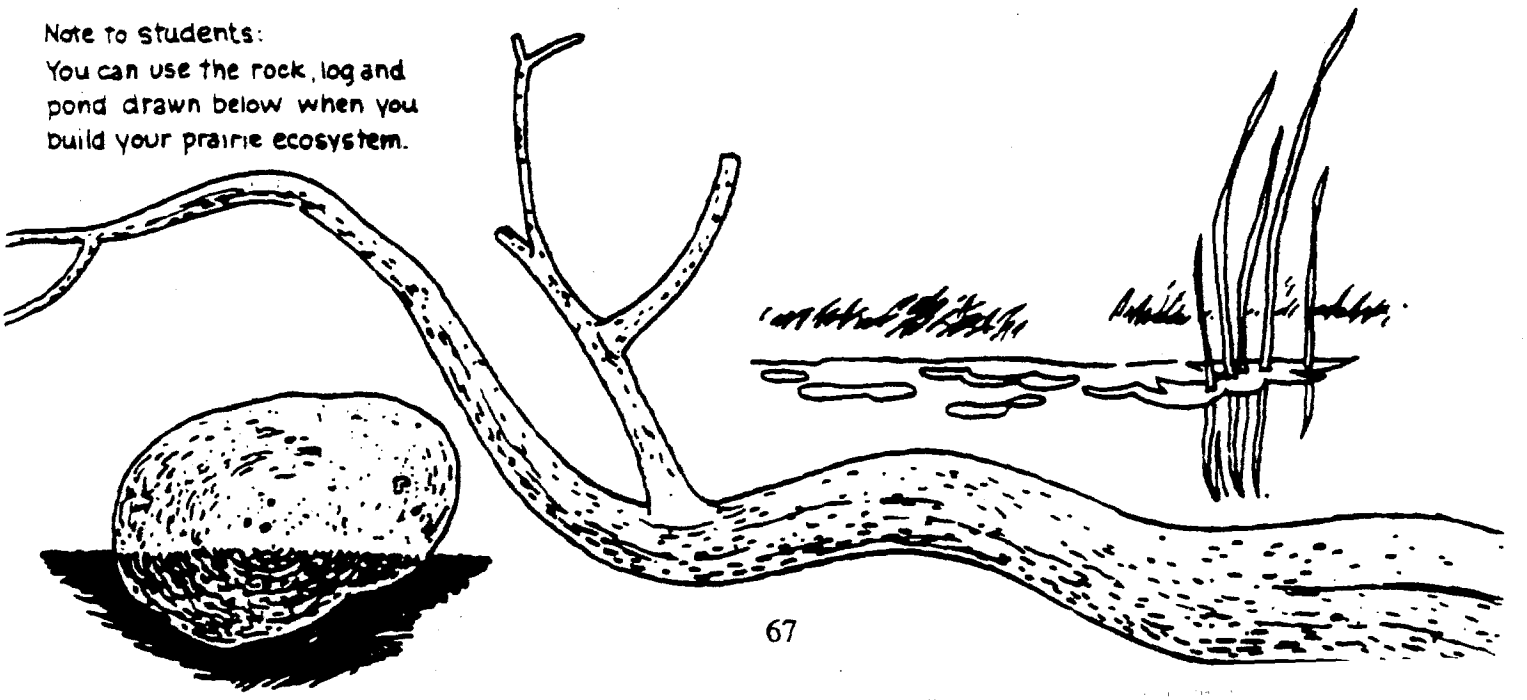
gopher frog

50-72", yellowish, dark blotches



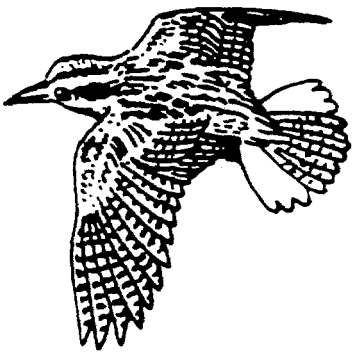
Bull snake

Note to students:
You can use the rock, log and pond drawn below when you build your prairie ecosystem.



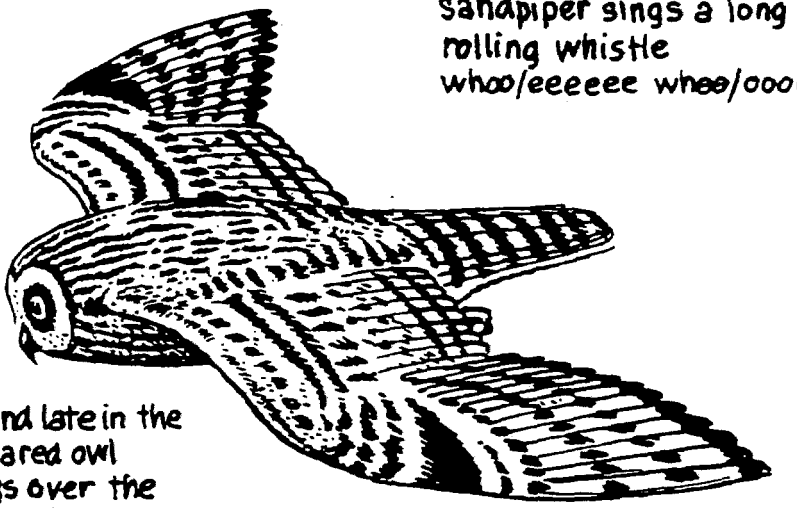
Prairie Birds

Birds add color, movement and beautiful sounds to the prairie.



The chunky brown meadowlark sports a brilliant yellow throat and vest crossed by a black V. When this bird flies, two broad patches of white can be seen on either side of the tail.

The song of the upland sandpiper is one of the most beautiful and mysterious sounds on the prairie. While circling slowly in the sky, the sandpiper sings a long rolling whistle whoo/eeeeee whee/ooooo



Early in the morning and late in the afternoon, the short-eared owl patrols on silent wings over the prairie. If it spots prey, it may hover and drop or it may snatch the prey from the ground and pass on without even checking its speed, so swift and skillful is its stroke.

The Role of Birds in the Prairie Ecosystem:

In addition to contributing to the beauty of the prairie, birds help the ecosystem function smoothly. Birds that pick apart the fruits of plants help scatter the seeds that will someday grow as new plants. Birds that eat only plant parts are known as *herbivores.*

Other birds on the prairie eat both plant parts and animals. These birds, known as *omnivores*, are important because not only do they help scatter seeds but they also help control the population of insects.

Birds of the prairie that are equipped with sharp talons and/or beaks are usually *carnivores*, which means they only eat other animals.

Working with Prairie Birds:

Work Step #3. Following is a description of eleven prairie birds. After each description are two blank lines. On the first line, write down what type of feeder each bird is. The choices are *herbivore, omnivore,* and *carnivore.* On the second line, write down the location of each bird's nest.

Work Step #4. On page 30, the eleven birds are drawn. It is your job to label each bird in the space provided. Be sure to use the clues written beside each drawing.

mourning dove: 12". This handsome dove is mostly gray to brown with white spots on its tail. It feeds on the seeds of plants and builds its nest in shrubs or trees at the edge of the prairie. _____ _____

upland sandpiper: 11½". This brown bird has a whitish belly streaked with black. When not flying or tending to its nest on the ground, it commonly perches on fenceposts. It feeds on insects, worms and plant seeds. _____ _____

Canada goose: 16-25". This goose has a black head and neck, with a white patch or "chinstrap" running into the side of the head. The Canada goose feeds on parts of plants, especially roots, and builds its nest on the ground near water. _____ _____

dickcissel: 6-7". The male dickcissel ha black bib on a yellow chest; the female is much paler in color and has just a touch of yellow on the chest. The dickcissel feeds on insects, plant parts and nests near or on the ground. _____ _____

killdeer: 9-11". This brown-backed, white-bellied bird is told by two black breast bands and its loud shrill call kill-dee, kill-dee. The killdeer feeds on insects, worms and snails and makes its nest in a small hollow on the ground. _____ _____

eastern meadowlark: The meadowlark feeds on insects and plant parts and builds its nest on the ground. (see word picture on page 27 for description) _____ _____

prairie chicken: 17-18". This bird is brown with dark bars. The male is told by orange air sacs on the side of the neck. During courtship, the male inflates those air sacs and then releases the air, causing a hollow oo-loo-woo sound known as "booming". The prairie chicken feeds on insects and plant parts and nests on the ground. _____ _____

loggerhead shrike: 9". This gray, black and white bird is told by its black mask. The loggerhead shrike preys only upon animals including insects, reptiles and amphibians, birds and small mammals. Lacking sharp talons to hold down its food, the shrike hangs the body of its pray on a thorn or fence barb so it can tear away at the flesh with its bill. The loggerhead shrike builds its nest in a shrub or small tree. _____ _____

turkey vulture: 26-32". This black bird soars on wings that spread 6 feet. At close range, one can see the turkey-like red head on the adult vulture. The vulture is the clean-up bird of the prairie, feeding upon already dead animals. The vulture nests on the ground. _____ _____

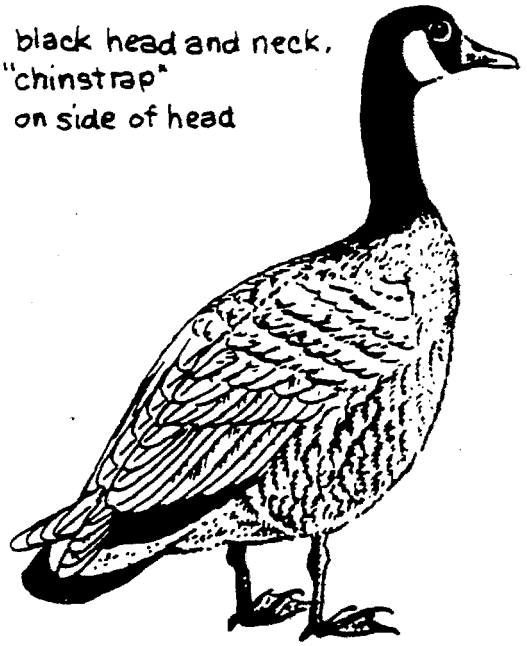
short-eared owl: 13-17". This streaked brown owl is named for the two short tufts of feathers located on its forehead. It preys upon insects, amphibians/reptiles, birds and small mammals and nests on the ground. _____ _____

marsh hawk: 17½-24". The female marsh hawk is streaked brown; the male, gray; but the best clue for identifying either sex is white rump. This slim hawk hunts low over the ground for insects, reptiles/amphibians, birds and small mammals. It nests on the ground. _____ _____

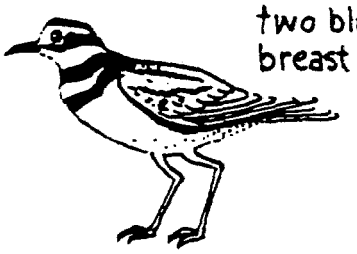
Prairie Birds

black bib on yellow chest

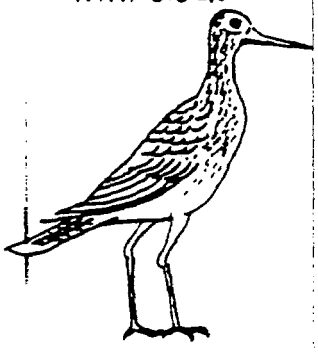
black head and neck, "chinstrap" on side of head



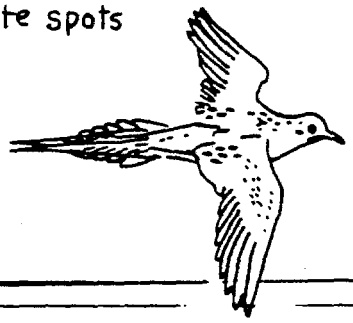
two black breast bands



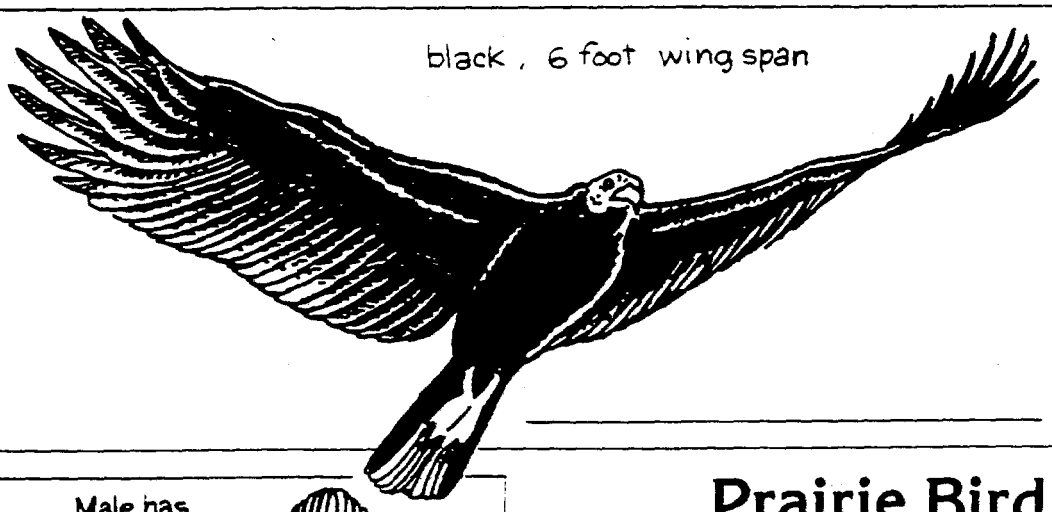
brown, whitish belly streaked with black



brown, pointed tail with white spots

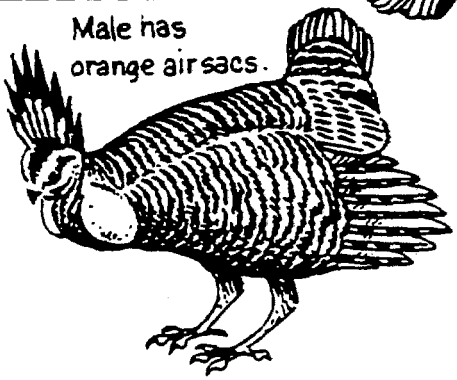


black, 6 foot wing span



brown, yellow throat and breast, black V crosses breast

Male has orange air sacs.



streaked brown or gray, white rump

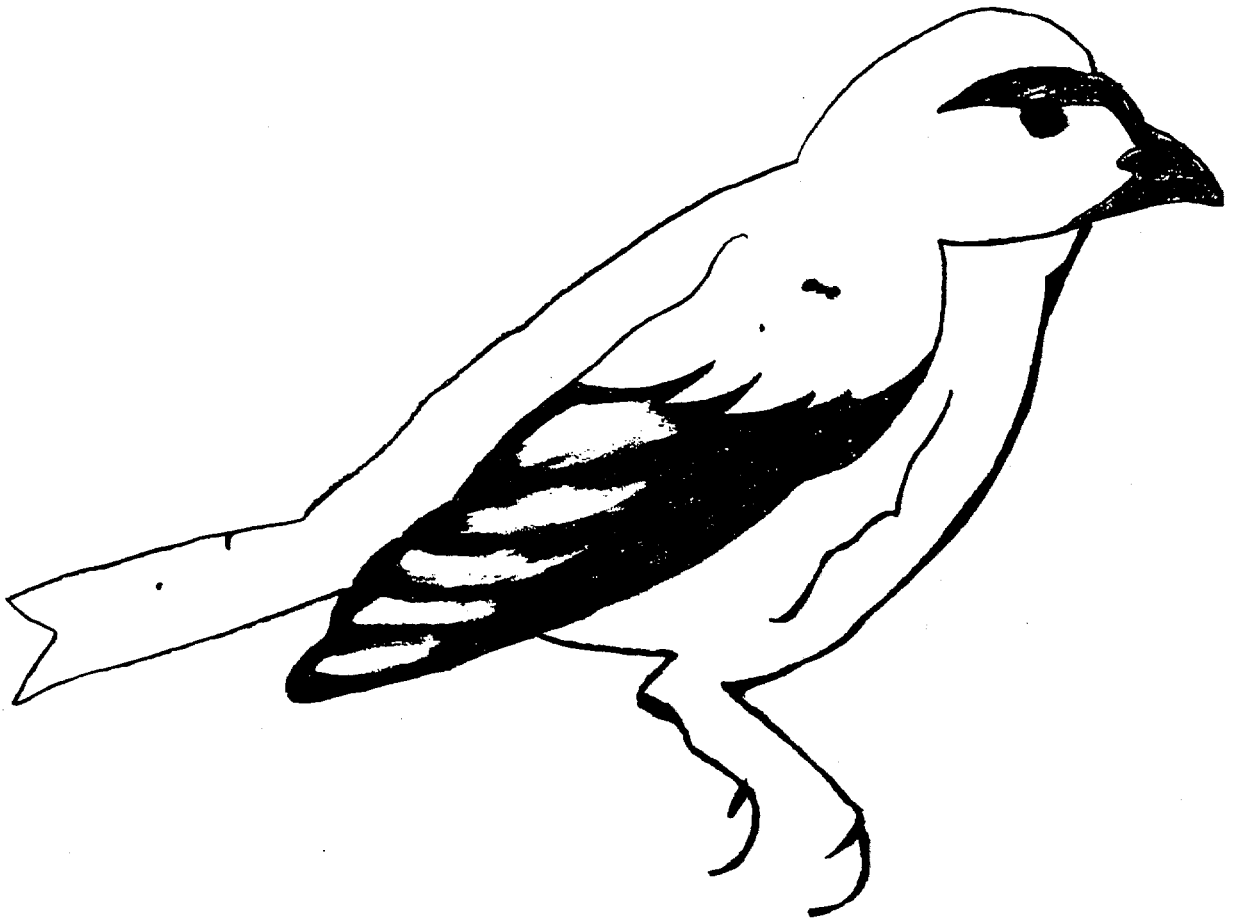
streaked brown, 13-17" tall

gray, black and white, black mask

LIFE-SIZE COLORING SHEET

MOURNING DOVE

LIFE-SIZE COLORING SHEET

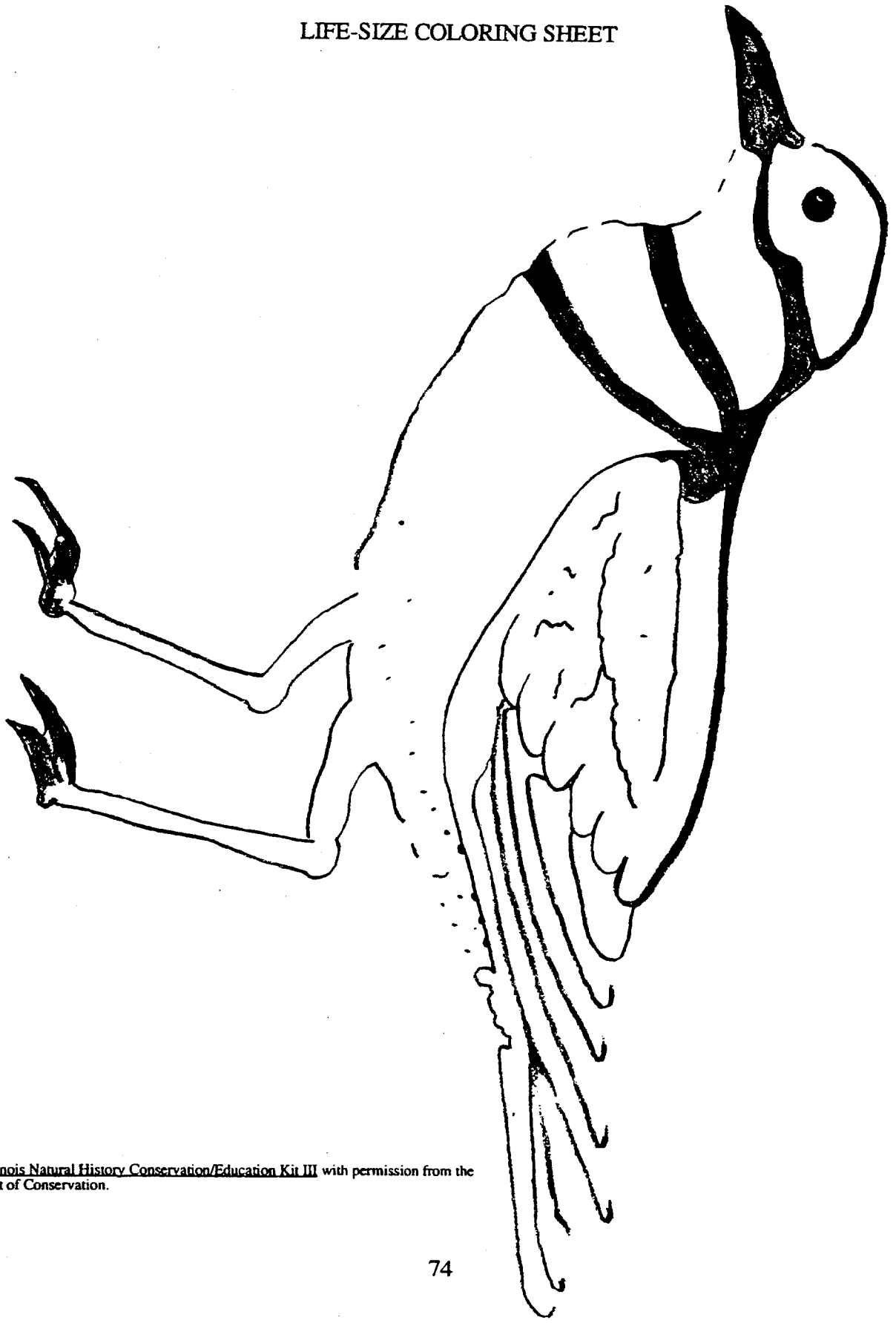


DICKCISSEL

LIFE-SIZE COLORING SHEET

SHRIKE

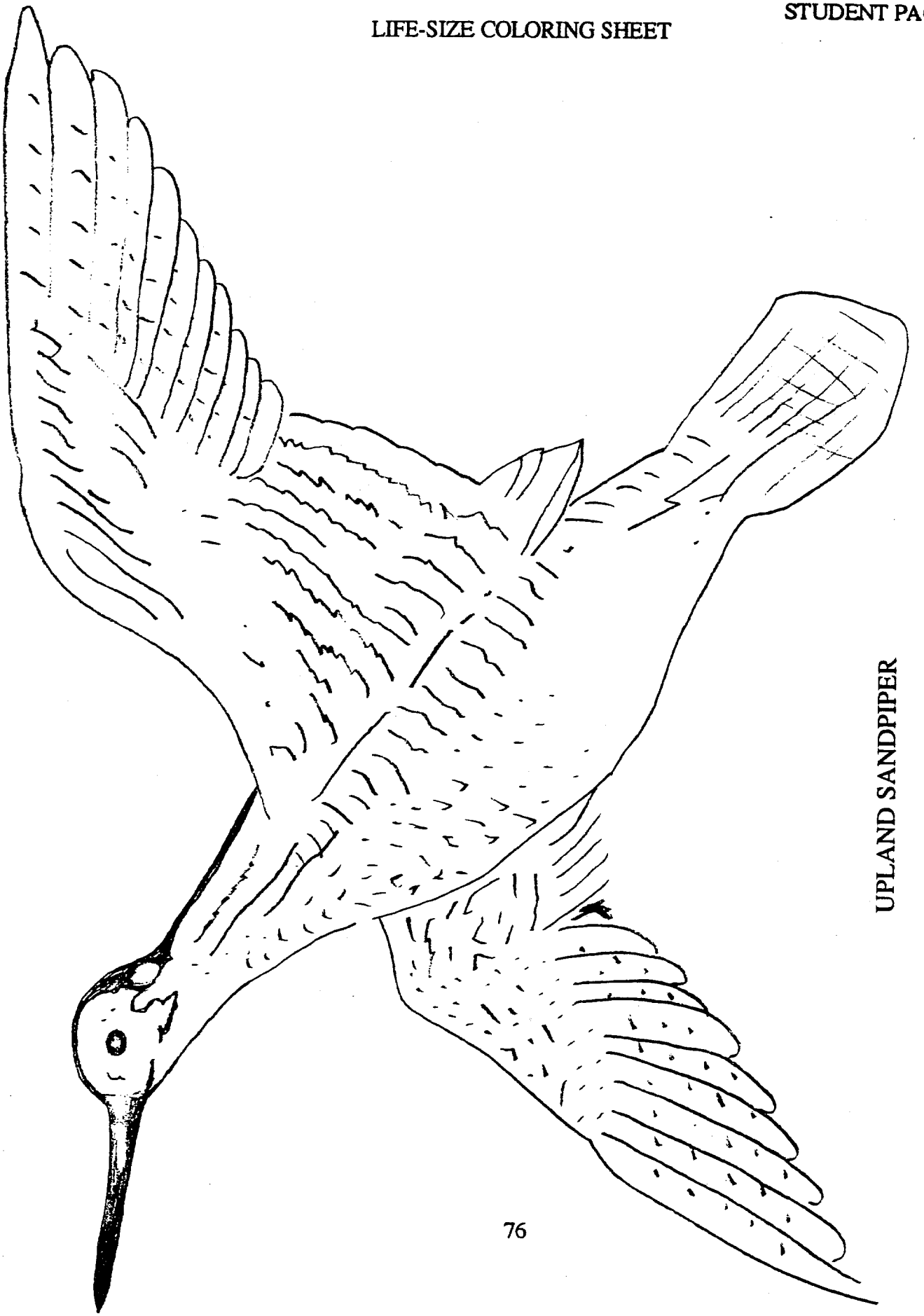
LIFE-SIZE COLORING SHEET



KILLDEER

LIFE-SIZE COLORING SHEET

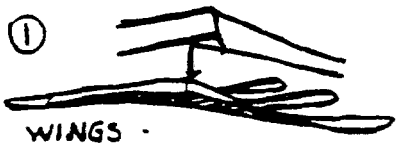
LIFE-SIZE COLORING SHEET



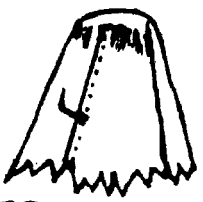
UPLAND SANDPIPER

BOBOLINK

The Marsh Hawk

① 

WINGS - CAREFULLY FOLD ON DOTTED LINES - GLUE CUT OVER TO DOTTED LINE. TO CURVE, GENTLY CURL WITH SCISSORS.

② 

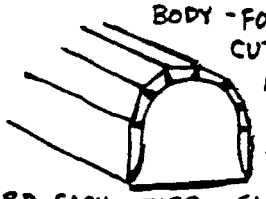
CUT ALL SLITS IN THE HEAD PIECE. GLUE THE BACK SLIT OVER THE X TO THE DOTTED LINE. (THE WINGS SLIDE INTO THE OTHER SLITS) GLUE THE SIDES OVER TO THE DOTTED LINES. THE SHAPE WILL BE LIKE A FLAT-TOP TENT.

③ 

EYE - PIECE - CUT SLITS & GLUE OVER TO DOTTED LINE - GLUE BACK SLIT OVER TO DOTTED LINE. CUT SLITS (FRINGE) AROUND FACE & FLUFF IT OUT

④ 

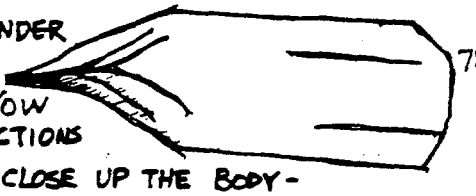
MATCH THE ROUNDED PART BENEATH THE EYE TO THE DOTTED LINES ON THE FRONT OF THE HEAD PIECE & GLUE IN PLACE

⑤ 

BODY - FOLD ALL DOTTED LINES - CUT ALL SLITS (SOLID LINES) - GLUE WHERE INDICATED - FOLD X TABS & SMALL TABS TOWARD EACH OTHER - GLUE FRONT FLAP OVER ALL TABS

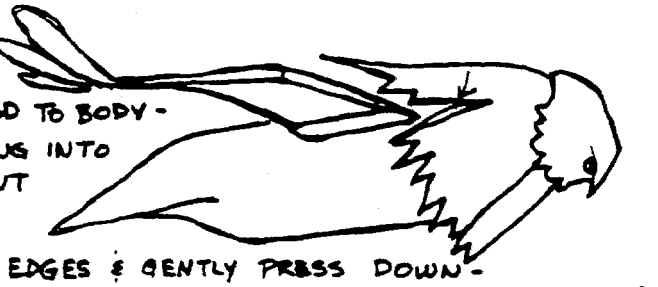
⑥ 

GLUE TAIL FLAP OVER THE O TABS



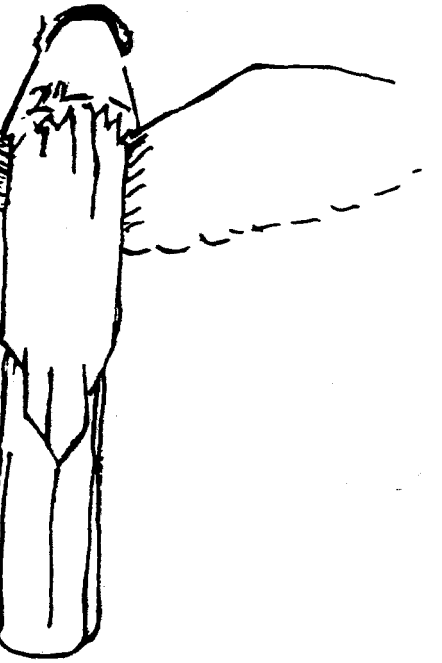
GLUE UNDER TAIL OVER Y TABS TO THE DOTTED LINE. NOW GLUE BOTH TAIL SECTIONS TOGETHER - THIS WILL CLOSE UP THE BODY -

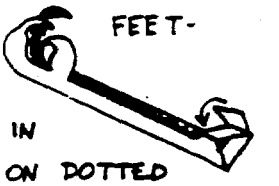
⑦ GLUE WINGS TO BODY AT A & B - GLUE FIRMLY!

⑧ 

GLUE HEAD TO BODY - SLIDE WINGS INTO SLITS - PUT GLUE ON POINTED EDGES & GENTLY PRESS DOWN - MOLD TO BODY SHAPE - (HEAD WILL BE POINTED DOWN)

⑨ GLUE TAIL UNDER BODY TO THE DOTTED LINE. MOLD TO CURVE OF BODY -



⑩ 

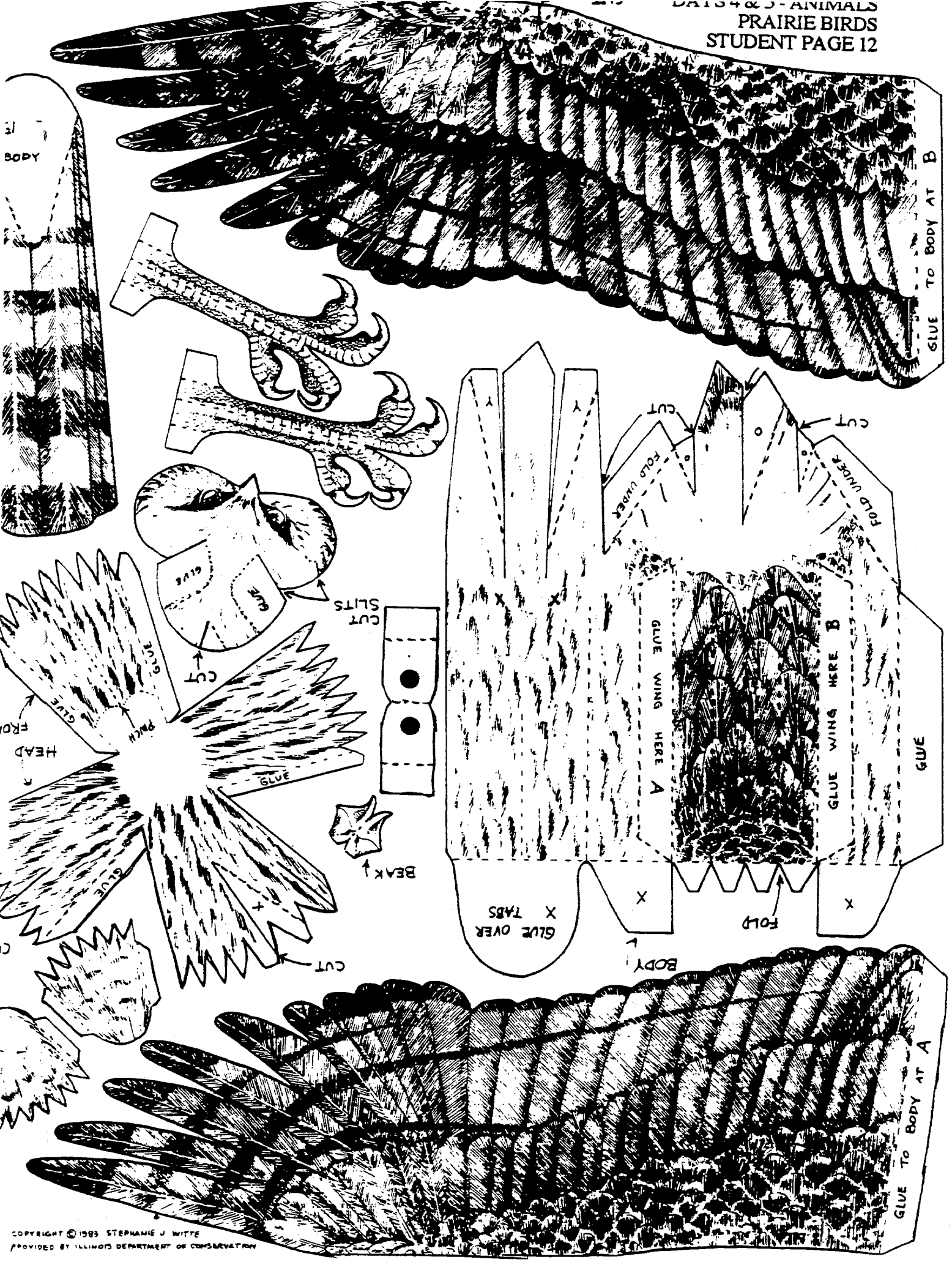
FEET - FOLD IN HALF ON DOTTED LINE. FOLD SQUARE ENDS OVER TO FORM TRIANGLE & GLUE. NOW GLUE FLAT SIDE UNDER BODY ON X

⑪ LEG FEATHERS - FOLD SIDES UNDER ON DOTTED LINE & GLUE TO BODY OVER TOP OF LEG.

⑫ BEAK - FOLD ON DOTTED LINES - GLUE TIPS OF BEAK TOGETHER. ATTACH BEAK TO POINT ON HEAD. ADJUST IT TO FIT FACE.

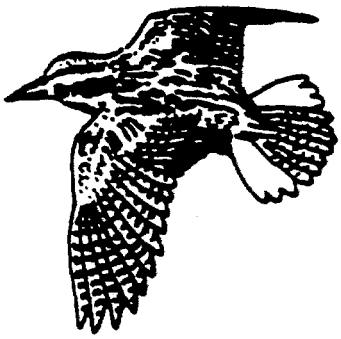
⑬ 

HANGER - PUNCH HOLES - FOLD IN HALF - GLUE TO BIRD'S BACK. USE ONLY IF YOU WISH TO HANG THE HAWK IN FLIGHT.



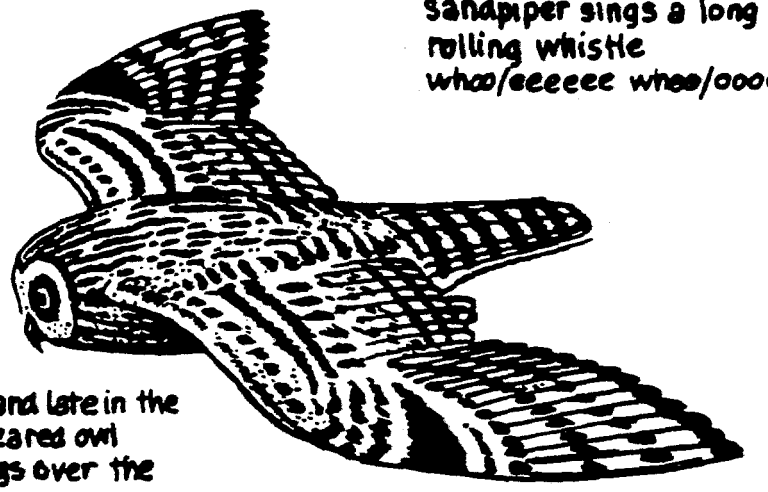
Prairie Birds

Birds add color, movement and beautiful sounds to the prairie.



The chunky brown meadowlark sports a brilliant yellow throat and vest crossed by a black V. When this bird flies, two broad patches of white can be seen on either side of the tail.

The song of the upland sandpiper is one of the most beautiful and mysterious sounds on the prairie. While circling slowly in the sky, the sandpiper sings a long rolling whistle whoo/eeeeee whoo/ooooo



Early in the morning and late in the afternoon, the short-eared owl patrols on silent wings over the prairie. If it spots prey, it may hover and drop or it may snatch the prey from the ground and pass on without even checking its speed, so swift and skillful is its stroke.

The Role of Birds in the Prairie Ecosystem:

In addition to contributing to the beauty of the prairie, birds help the ecosystem function smoothly. Birds that pick apart the fruits of plants help scatter the seeds that will someday grow as new plants. Birds that eat only plant parts are known as *herbivores*.

Other birds on the prairie eat both plant parts and animals. These birds, known as *omnivores*, are important because not only do they help scatter seeds but they also help control the population of insects.

Birds of the prairie that are equipped with sharp talons and/or beaks are usually *carnivores*, which means they only eat other animals.